The Economics of Multipoint Distribution Service: An Anthology

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THE ECONOMICS OF MULTIPOINT DISTRIBUTION SERVICE (MDS): AN ANTHOLOGY

Table of Contents

THE ECONOMICS OF MULTIPOINT DISTRIBUTION SERVICE (MDS): AN ANTHOLOGY

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Multipoint Distribution Service

by Mark Nadel

Multipoint Distribution Service (MDS) is a broadcast technology for transmitting "addressed" 1/ programming over microwave frequencies to those with special antennas in a line of sight within approximately 25 miles of a transmittor. 2/ Regulated as a common carrier service, MDS operators lease access to program suppliers and are subject to FCC regulation of carrier charges, terms, and conditions. 3/ Until 1983 MDS service was almost exclusively a single channel service and only 840,000 were served in 1982, but a May 1983 FCC ruling 4/ will now permit up to 10 channels of service.

I. History 5/

The FCC first allocated a portion of the radio spectrum for MDS in 1962, 6/ but the service did not attract any real interest until 1970, when a technical error was corrected in the FCC rules, permitting MDS to be used to transmit full color video. 7/ Immediately thereafter, firms quickly began applying for licenses (148 by March 31, 1972), 8/ leading the FCC to initiate a rulemaking to establish a method for regulating this new multi-point common carrier service. 9/ In 1973 Microband Corporation of America initiated the first MDS commercial services to two Washington-area motels 10/ and by 1974 the FCC had approved rules which provided for two channels in each of the largest markets. 11/

The demand for licenses, however, quickly forced the FCC to establish comparative licensing standards, analogous to those for radio and television broadcasting; 12/ and also to defend its jurisdiction against state encroachment. 13/ Meanwhile, its concern with interference between the two MDS channels 14/ and its decision to avoid allocating 2 channels to the same operator 15/ combined to prevent 2 channel service from reaching any viewers. 16/

In 1973, based on the excess demand for MDS channels, a leading MDS equipment producer had petitioned the FCC to expand the spectrum allocation for MDS, 17/ pointing out that the vast majority of the 28 channels neighboring MDS were "totally unused and wasted," 18/ while a lack of channels was denying MDS service to many communities. 19/ The groups in control of those channels, however, disputed that a reallocation would be in the public interest 20/ and no action was taken. 21/ Most MDS operators seem to have been content to provide a single channel business service. 22/

After the 1974 rules were passed, however, distribution of pay TV programming began to dominate operations. When multiple pay service gained acceptance and a study predicted that only multiple service would allow MDS to become competitive with other pay TV technologies, 23/ a new effort was made to increase MDS channel capacity. Industry leader, Microband unveiled an "Urbanet" plan whereby 12 new channels would be added to the previous 2 channels and all 14 then grouped into 2 5-channel and 1 4-channel groups. 24/

In 1982 the first 2-channel service commenced in Phoenix, Ariz., 25/ and soon after an 8-channel MDS experiment was conducted in Salt Lake City. 26/ Based on the success of the latter the FCC decided in May 1983 to allocated 8 new channels to MDS, to be used in 2 groups of 4. 27/

II. Some Issues

A. Reception Problems

Because MDS requires a line-of-sight to recipients, it is much better suited for markets with flat terrains. In cities with many large buildings or communities with hilly topographies, the potential audience may be significantly limited by interference contraints. In addition, the installation of receiving antennas is often a very delicate and time-consuming operation. 28/

B. Economics

The headend equipment, which generally includes a 10 watt transmitter, is reportedly to cost about $700,000-900,000. 29/ Standard subscriber equipment is expected to range between $150-200 in 1984 while addressable equipment is predicted to cost $200-300. One consulting firm estimates that operators may charge $50 for installation and a $20-23 monthly fee or alternatively, $150-200 for installation and a $15-18 monthly fee. 30/ This would permit an operator to break even with 4,000-5,000 subscribers, substantially less than a single channel STV operator requires. 31/

FOOTNOTES

1/ Unlike traditional broadcast receivers, MDS receivers are only activated when the signal received has the address code that they have been assigned. For a more detailed discussion of the technology and equipment, see K. Glen, Report on Multipoint Distribution Service, prepared for the Federal Communications Commission Network Inquiry Special Staff (Nov. 1979) at 59-65.

2/ Id.

3/ 47 C.F.R. §21.90 3(b) (1982). MDS operators are subject to regulation under Title II of the Communications Act of 1934, 47 U.S.C. §§201 et seq; for some sample tariffs, see THE MDS DATABOOK 47-48 (Paul Kagan Assoc., Oct. 1982) [hereinafter Kagan].

4/ See Instructional Fixed Television Service, 54 RAD. REG. 2d (P&F) 107 (1983).

5/ For a more detailed history of MDS, see Kagan, supra note 3 at 49-54.

6/ Report and Order in Docket No. 14712, 39 F.C.C. 834 (1962). The service was granted the 2150-60 MHz segment of the portion that the FCC has allocated for common carrier use on a shared basis with private systems in Fifth Report and Order in Docket No. 12404, 24 Fed.Reg. 1417 (1959). Actually, multi-point transmission over microwave frequencies occurred prior to 1962 also, see, e.g. Universal Service Wireless v. FRC, 3 FRC.ANN.REP. 37 (1929) (construction permit for public utility service of the press) and Press Wireless, 1 FCC.ANN.REP. 34 (1935) (shortwave radio stations engaging in point-to-point and multiple address transmissions of news service). In 1953, a proposal for multiple address distribution of movies to theaters was authorized, Theatre Television Service, 9 RAD.REG. (P&F) 1528 (1953), but it never commenced operation. For more details, see K. Glen, supra note 1, at 14.

7/ The original FCC rules implementing the 1959 allocation of 2110-2200 MHz, specified a maximum bandwidth of 5 MHz per channel, 24 Fed.Reg. 6052 (1959), but when a 10 MHz segment was designated for MDS service, the agency appeared to reject a 5 MHz limit as too narrow. Report and Order in Docket No. 14712, 39 F.C.C. 834, 836 (1962). When a petition was filed by Varian Associates (a major equipment supplier) RM-1188 (July 25, 1967) proposing a maximum bandwith of 3.5 MHz for operators elsewhere in the 2110-2200 MHz band, however, it was inadvertently approved for the MDS portion also and this was not corrected until 1970. Memorandum Opinion and Order re Section 21.703(g), 47 F.C.C.2d 957 (1970).

8/ Notice of Proposed Rulemaking in Docket 19493, 34 F.C.C.2d 719 (1972).

9/ Id. These rules provided the technical standards for the service, as it is technically different from point-to-point microwave used elsewhere in the band.

10/ Microband Corporation of America was the first to transmit an MDS test signal in January 1973, and first to link MDS to domestic and int'l satellite systems in 1974-75. Kagan, supra note 3, at 49-50.

11/ Report and Order in Docket No. 19493, 45 F.C.C.2d 616 (1974), reconsid. denied, 57 F.C.C.2d 301 (1975). 2150-2156 MHz was designated as channel 1 and 2156-2162 MHz as channel 2 in the 50 largest metropolitan markets. In other markets, a 4 MHz channel, 2156-60, was designated as channel 2A in lieu of the 6 MHz channel 2. Id.; 47 C.F.R. § 901 (b).

12/ See Peabody Telephone Answering Service, 55 F.C.C. 626 (1975) (listing five factors to be considered in a comparative hearing).

13/ See Midwest Corp. and Two-Way Radio of Carolina, Inc.,, 53 F.C.C.2d 294 (1975); Orth-O-Vision, Inc., 82 F.C.C.2d 178 (1980), aff'd New York State Commission on Cable Television v. FCC, 669 F.2d 58 (2d Cir. 1982) (States are preempted from regulating satellite master antennas due to their use in MDS reception, a technology subject to exclusive federal regulation).

14/ See Report and Order, 45 F.C.C.2d at 620-22; 47 C.F.R. §21.901(c) (1982) ("Channels 2 and 2A will be assigned only where there is evidence that no harmful interference will occur . . ."). See also, 47 C.F.R. §21.902.

15/ 45 F.C.C.2d at 622; 47 C.F.R. §21.901(d)(1982) (No dual licenses are permitted unless the applicant has waited a minimum of 1 year and there is public demand unlikely to be satisfied by others).

16/ "Because of the number of mutually exclusive applicants, there are very few cities where channel 1 and channel 2 are operating simultaneously. See Notice of Inquiry and Proposed Rulemaking in Docket No. 80-113, FCC 80-137 (released April 24, 1980)" Radiocall Corp., 85 F.C.C.2d 596, 597 n.5 (1981).

17/ Varian Associates, Petition for Rulemaking, RM-2213 (June 14, 1973); Glen, supra note 1, at 26.

18/ In 1963, 31 6-MHz channels were authorized to be used for "the transmission of instructional and cultural material," see Report and Order in Docket No. 14744, 39 F.C.C. 846 (1963); see Glen, supra note 1, at 26.

19/ Because the lengthy comparative hearings among mutually exclusive MDS applicants and interference problems caused by congestion, many communities were denied service. See note 16, supra; Microband Corp. of America, 41 F.C.C.2d 184 (1973).

20/ See Glen, supra note 1, at 27.

21/ The FCC's action on the Microband petition in 1982, supra note 4, appears to have been made politically possible by permitting incumbant ITFS licensees to enjoy financial benefits by leasing their channels. See MacNeice, "Catholic Church May Lease ITFS Channels to MDS Ops," Multichannel News, Dec. 27, 1982, at 18, col. 1.

22/ See, e.g. Notice of Inquiry, Proposed Rulemaking and Order (Gen. Docket No. 80-112), 45 Fed. Reg. 29,323, 29,325 (May 2, 1980); BROADCASTING, Dec. 8, 1975, at 2. ("Microband has specifically enunciated its intention to create a network [for] . . . business communications and information.").

23/ In 1974, the FCC had observed that, "There appears to be little economic benefit to be gained by giving one entity a two channel monopoly in any community." 45 F.C.C.2d at 622, but the economies of scale in marketing, management, and transmitter site costs that the FCC had recognized even then, id., seem to have been significant enough for industry experts and the FCC to find multi-channel service valuable. See, e.g., Browne, Bortz & Coddington, The Impact of Competitive Distribution Technologies on Cable Television (1982) (prepared for the Nat'l Cable Television Ass'n).

24/ Microband proposal comments to 80-112, 113 (Feb. 12, 1982).

25/ Hinte, "MDS: A New Industry Comes of Age," SAT GUIDE, Sept. 1982, at 26, 42.

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27/ See note 4, supra.

28/ See Non-Cable Pay TV Service 118-119 (Int'l Resource Development, Inc. Mar. 1983).

29/ Id., at 122.

30/ Id., at 123-24.

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ECONOMIC BREAKEVEN ANALYSIS FOR SINGLE AND MULTICHANNEL MDS

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APPENDIX A. BREAKEVEN MODEL VARIABLES

This appendix provides a more detailed justification for costs used in the single and multichannel MDS breakeven analyses. An initial source (Table A-1) was cost estimates provided by Microband based on interviews with operators. These were supplemented by a review of secondary sources and BBC interviews with equipment manufacturers, program suppliers, and MDS operators.

Capital Equipment Costs

The two principal categories of capital equipment costs are headend equipment, the costs of which are fixed, and in-home subscriber equipment, which varies directly on a per subscriber basis.

Headend equipment. The MDS operator is responsible for supplying a satellite receive only earth station (TVRO) and paying a special charge for a 100 watt amplifier if transmission is at 100 watts. Standalone origination equipment is required if the operator self-programs the service.

Satellite receive only earth station prices have dropped consistently over recent years to the point where some are being offered to the home market for $5,000 or less. Commercial units are priced as low as $8,000 to $12,000.(1) For this analysis, a range of $15,000 to $25,000 is assumed for TVRO costs to account for a high quality unit and installation expenditures. A 100 watt amplifier is priced at approximately $15,000.(2) Single channel MDS headend capital equipment costs are estimated at $15,000 to $40,000.

The incremental costs of multichannel MDS vary tremendously, depending upon system security characteristics and the programming carried. At the simplest level, only additional earth station receivers are necessary. Alternatively, a second earth station could be required if programming from more than

REVENUE AND EXPENDITURE FACTORS
Typical MDS Pay TV Operation
(based on recent survey)

	INDIVIDUAL/BULK SUBSCRIBER PROFILE		
EXPENDITURES	Private Home	Multiple Dwelling Unit	Bulk Apt. Condo/Hotel
Reception Equipment	$75-100 one time	$3-500 plus $15 each one time	$3-500 one time
Installation	$35-40 one time	$200-2,000 one time	$200-2,000 one time
Direct Selling	$20-25 per sub. - one time	$20-30 per sub. - one time	Est. $500 per bldg. - one time
Program Guide/ Billing Collection	.50-.75 per sub. per month	.60-.75 per sub. per month	.25 per sub. per month
Programming Package (via Satellite)	$3.50-4.50 per sub. per month	$3.50-4.50 per sub. per month	$3.50-4.50 per month per equiv. occupancy
Programming Package (Stand-alone)	$2.50-3.50 per sub. per month	$2.50-3.50 per sub. per month	$2.50-3.50 per month per equiv. occupancy
All-nite Programming	.10-.85 per sub. per month	.10-.85 per sub. per month	.10-.85 per month per equiv. occupancy
Satellite Earth Station	$15,000 - $25,000 one time/installed		
Microwave Link (STL)	$15,000 - $25,000 one time/installed plus $275 per month		
Stand-alone origination equipment	$30,000 — $50,000 one time/installed plus $ 2,000 per month for operations personnel		
MDS transmission tariff a) based monthly fee protected	--- $3,500 per month		
unprotected	--- $2,500 per month		
b) connection point charge	.65 per sub. per month	.65 per sub. per month	.65 per month per equiv. sub.
Advertising Expense	variable	variable	variable
Number of installs per day per truck	2-4 per day	5-6 per day	all in one day

TYPICAL REVENUES	Private Home	Multiple Dwelling Unit	Bulk Apt. Condo/Hotel
Service Fee	$14-18 per month	$12-13 per month	$7-9 per month
Security Deposit/ Install Fee	$75-125 one time	$15-25 one time	N/A
Guide Advertising	N/A	N/A	N/A

Source: Microband Corporation of America. All figures were independently verified as reasonable by BBC before use in the modeling component of this report.

one satellite is desired. Computer and encoding capability for an addressable system would also substantially increase headend costs. For example, computer capability for an addressable cable system adds from $18,000 to $125,000 to headend costs, depending on system capability, although most units are priced under $50,000.(3)

The BBC model assumes headend costs of $20,000 to $50,000 for a non-addressable multichannel system. Headend costs for an addressable system would be in the $60,000 to $100,000 range.

Subscriber equipment. Single channel MDS receive equipment includes an antenna, downconverter, power supply and related equipment such as antenna mounts and an on-of switch. Equipment costs have declined dramatically over the last few years. Price levels reported over the last year include:(4)

- Electroline of Montreal--A-B switches $1.95 (quantity 500).
- Lindsay--antennas--$14.20-$21.50 (quantity 100); down-converter-antenna packages $50-$100
- Standard--$50 for antenna/downconverter combination, $73 with variable power supply, $86 with AFT power supply
- Bogner Multitenna Corp.--21 dB twin-rod antenna, $28 (1,000 quantity) or $70 as a package with TEST down-converter.
- TEST--low wind antennas, $18-24 (depending on gain). Combination antenna--downconverter package $63-$80 with standard performance downconverter, $106-123 with low noise downconverter)
- Oak--Crystal controlled downconverter-antenna-power supply package $92.50 in large lot.

The BBC model uses a range of $75-100 for the single channel case, with the figure varying according to antenna gain and noise characteristics and tunability or crystal control in the downconverter. It should be noted that the most expensive units are usually installed only on the fringes of an MDS signal

coverage area, with less expensive combinations used for the bulk of installations.

Multiple dwelling unit equipment is more expensive on an absolute basis but usually less expensive per subscriber. Microband data (see Table A-1) indicate reception equipment for multiple dwelling units is in the $300-500 range plus $15 per subscriber while bulk apartment or condominium units can be equipped for $300-500. Because the BBC model assumes all subscribers reside in single family residences, the multifamily equipment prices are not utilized.

At the simplest level, a multichannel MDS system would require only a relatively simple converter to handle up to five channels and a second antenna. Microband personnel estimate these could be provided for approximately $25-$50 per subscriber.(5)

Subscriber equipment for an addressable system, which would both enhance security and provide ancillary revenue opportunities such as pay-per-view, are substantially more expensive. Addressable cable terminals are priced at approximately $100-185, depending upon price and quantity.(6) Total multichannel MDS in-home equipment (antenna--downconverter combination plus subscriber terminal) for an addressable system would be a minimum of $200 and a maximum of $300. The upper figure accounts for possibly low production runs for an MDS specific unit, or alternatively, could be a terminal with enhanced capabilities such as videotex.

Operational Costs

Operational cost categories include programming, station tariff, program guide and billing, advertising/marketing, and other variable (e.g., maintenance, bad debt) and fixed (e.g., administrative salaries, rent, telephone) operational costs.

Programming. Programming is among the largest single cost elements in both the single and multichannel systems. At present, most MDS systems take a satellite feed from a national program service such as Home Box Office (HBO), Showtime or The Movie Channel. Others are self programmed or affiliated with a smaller program entity, such as Starcase (Entertainment Systems) or Showbiz (Texas Entertainment Network). Microband price data (Table A-1) suggest self programming may be less expensive than a satellite feed on a variable cost basis although a fixed cost of $30,000 to $50,000 is present for origination equipment. The BBC model is based primarily on satellite fed programming charges.

HBO presently has a wide range of MDS program charges, some above and some below the rates charged cable operators. They are moving (January 1, 1982) to a standard rate for all delivery modes of $4.70 plus 10 percent of all subscriber fees over $9 per month.(7) The charge for a $15 per month MDS subscriber would therefore be $5.30 per month ($4.70 + .60). However, substantial volume discounts are available, with operators allowed to aggregate subscribers across systems:

HBO Subscribers	Discount
10,000	2%
25,000	3½
40,000	5
75,000	15
100,000	20

In other words, the charge for a $15 per month subscriber on a system operated by an entity with more than 100,000 combined HBO subscribers would be only $4.24 monthly.

Showtime charges a flat monthly rate of $4.00 per MDS subscriber, regardless of the subscriber fee. Showtime offers the following volume discounts:(8)

Showtime Subscribers	Monthly Fee For MDS
0 to 1,000	$4.00
1,000 to 2,000	3.90
2,000 to 10,000	3.85
10,000 to 50,000	3.75
50,000 to 100,000	3.65
100,000 and over	3.50

The Movie Channel charges a flat $4.50 monthly fee for MDS regardless of subscriber charge or number of subscribers.(9)

The single channel MDS model incorporates a $4.00 per month ($48 per year) program charge for the low cost system, $5.50 per month ($66 per year) for the high cost system.

Defining programming costs for multichannel MDS is difficult because of the dynamically assignable nature of the proposed five channel system. In essence, a variety of program services of a rapidly changing nature could be programmed on the service. For analytical purposes, BBC assumed a five channel system with per channel costs typical of those for the cable television industry. Neither the cost nor revenue from pay-per-view programming is included in the model.

Total programming costs are estimated at $8 per month per subscriber ($96 annually) for the low cost multichannel system, $14 per month ($168 annually) for the high cost service. The low cost option would correspond to a service offering one premium pay service and a lower cost "mini" premium service such as Home Theatre Network or The SportsChannel. In the high cost option, two premium services plus a higher priced "mini" premium service are assumed.

The remaining channels in the low and high cost options are assumed to be similar in cost to "basic" satellite delivered cable programming. Basic cable programming costs are now in the free to $.20 per subscriber per month range although prices are generally declining. Most program ventures announced within the past year, including Daytime (ABC-Hearst), Satellite News Channels (ABC-Westinghouse) and The Weather Channel (Landmark) will be provided free to cable operators.(10)

Station tariff. The newest Microband tariff contains the following charges for protected service:(11)

Charge	Microband Tariff (monthly)
10 watt base fee	$4,000
Station connection charge	.90 per subscriber
100 watt service	$300

Microband tariff charges for multichannel service had not been determined at the time this economic analysis was undertaken. In the absence of a firm rate, Microband provided the following hypothetical tariff:

> Low cost scenario: $6,000 per month plus $2.00 per multichannel subscriber per month
> High cost scenario: $7,500 per month plus $3.00 per multichannel subscriber per month

Program guide/billing. MDS operators typically send subscribers a monthly program guide along with, or in addition to, a monthly bill. HBO and Showtime program guides are available for approximately 5¢ and 20¢ per guide per month, respectively.(12) Program guide costs for a self-programmed service range upwards from approximately 5¢ each (32 page digest size, 4 page 4 color enamel, 28 pages newsprint)(13), exclusive of editorial costs.

Billing costs also vary depending upon whether or not the operator performs its own billing or uses an outside service. CableData, a major cable industry billing agent, charges from 18¢-30¢ per subscriber per month plus postage.(14)

The BBC model incorporates a range of $.60 to $.75 per month per subscriber ($7.20 to $9.00 per subscriber per year) in the single channel case. This is similar to the numbers used by Microband (Table A-1)--slightly higher than figures outlined above to account for investing, mailing list preparation, etc.

For multichannel subscribers, billing and program guide costs are assumed to range from $.75 to $1.00 per month per subscriber ($9.00 to $12.00 per subscriber per year). The higher figures account for the additional complexity and cost of a program guide devoted to several programming services.

Advertising/marketing. Advertising and marketing costs are among the most variable of all MDS expenditures. A system advertising budget will depend, among other factors, on the presence of competitive pay TV distribution modes (e.g., STV, cable), the degree of single family vs. multifamily or bulk unit marketing, and the desired speed of financial breakeven. In many cases, high advertising expenditures may raise the breakeven level of operation but shorten the timeframe within which it is achieved. Advertising expenditures will also usually be highest during the initial marketing phase and decline as the system becomes more established.

Monthly MDS operator advertising expenditures can vary from almost nothing up to $50,000 or more. For example, Multicast reports Centerstage in Lexington, Kentucky spends $2,000 per month for radio and some print; First National Home Theatre, by contrast, spends up to $50,000.(15) With the exception of the largest market systems, advertising expenditures for most operators appear to be less than $10,000 per month.(16)

The BBC single channel model uses a range of $25,000 to $100,000 annually for advertising expenses. It is recognized that some larger market stations will exceed this figure. A range of $10,000 to $50,000 monthly ($120,000 to $600,000 per year) is used for multichannel systems. The higher level is a result of two factors:

- Multichannel MDS, at least initially, will be limited to larger markets where advertising expenses are comparatively high.
- Multichannel MDS will probably be priced significantly above the single channel system. Pay TV is price sensitive, resulting in higher marketing costs per sale in the multichannel case.

Other variable costs. Equipment maintenance and bad debt are the two principal variable costs not covered under other categories. Unfortunately, few data are available as to the size of these factors in the MDS industry. Equipment maintenance costs appear to be fairly low for single channel MDS because of the relative simplicity of the equipment. Based on interviews with MDS operators(17) and microwave engineers(18), maintenance costs are estimated to average from $1.00 to $1.50 per subscriber per month. Bad debt is estimated at 3 percent monthly.(19) Total variable costs are estimated at $1.50 to $2.00 per subscriber monthly in the single channel case, double that for multichannel subscribers because of the greater complexity of the subscriber equipment and higher monthly subscriber fees.

Fixed operating expenses. The fixed operating costs of an MDS operator include administrative salaries, rent, travel, legal services, utilities, telephone, insurance and related costs incurred in operating a business. Receiving and processing of consumer orders and scheduling installation and service calls are also included in this category. MDS fixed costs tend to be low because only a small amount of non-prime office space and a modest staff are required. Not

including installers or billing staff (whose costs are covered under other categories of the model), total staffing could range from four to 15 persons for most MDS operators.(20) Most staff positions are for lower skill levels hence per employee salary levels are fairly low.

Based on the foregoing staffing figures, with an allowance for overhead, fixed operating costs are estimated to range from $150,000 to $500,000 annually for most single channel MDS operations.

The fixed costs of multichannel MDS should not increase significantly above the single channel level although some staff increase will be required. Multichannel MDS fixed costs are estimated to range from $250,000 to $600,000.

Other Financial Factors

Depreciation. Five year straight line depreciation is used in both the single and multichannel models. In actual practice, more accelerated depreciation practices are probably used (e.g., three years), resulting in higher depreciation costs in the initial years, lower ones in later years. The use of the five year straight line method is a simple approach, designed to even out system costs over an assumed five year equipment life.

Interest. Interest rates have been extremely volatile over recent years causing difficulty in establishing a set rate for consistent economic analysis. The BBC model uses 18 percent.

It is also assumed all capital costs are borrowed. While this is an obvious simplification it does provide an imputed value for invested capital. The interest equation takes the form .5I, reflecting average interest expenditures over the payback period assuming principal is paid down in equal installments over loan life. In other words, interest payments are usually highest immediately after funds are borrowed and thereafter decline. The BBC model averages these costs over the term of purchase, in this case assumed to be five years.

APPENDIX A. REFERENCES

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(4) Paul Kagan Associates, MultiCast, December 19, 1980, p. 3 and May 29, 1981, p. 3.

(5) Interview with Al Dalimonte, Microband Engineer, October 1981.

(6) Larry S. Levine, Future Costs and Performance of Pay Cable and Subscription Television Technologies, Kalba Bowen Associates, Inc., May 30, 1980, p. iv; BBC interviews with equipment manufacturers, December 1980-January 1981 and "Addressing the Addressability Issue," op. cit, p. 82.

(7) HBO pricing data is from interview with Bill Grumbles, Midwest Sales Representative, HBO, October 21, 1981.

(8) Interview with Mark Hotz, Showtime, October 27, 1981.

(9) Interview with Scott Hultz, Midwest Sales Represenative, The Movie Channel, October 21, 1981.

(10) "Traffic Jam On Cable Ramp," CableVision, August 31, 1981, p. 37.

(11) Interview with Don Franco, President, Microband, October 6, 1981.

(12) Grumbles, op. cit., and Hotz, op. cit.

(13) Interview with Carl R. Kehler, President, Cable Communications Media, Inc., January 10, 1981.

(14) Interview with Marcia Dale, Marketing Representative, CableData Corporation, June 5, 1981.

(15) Paul Kagan Associates, MultiCast, October 15, 1980, p. 5 and September 24, 1981, p. 4.

(16) Paul Kagan Associates, MultiCast, various dates and pages.

(17) Based on survey of MDS operators by Don Franco, President, Microband, October 1981 and interview with Jerry Madison, Marquee, October, 22, 1981 and Dave Senspiel, Movie Systems, Inc., October 27, 1981.

(18) Hart, op. cit.

(19) Madison and Senspiel, op. cit.

(20) Franco, op. cit.

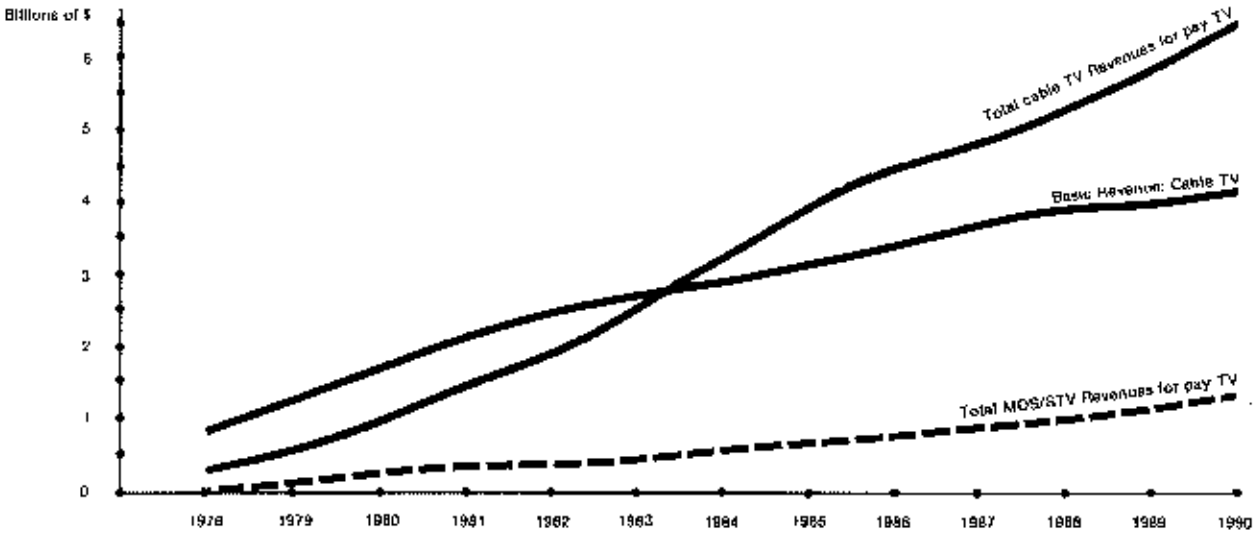
High Definition Television to the Year 2000

KALBA BOWEN ASSOCIATES INC.

A report for CBS Television Network

January 1982

Table 3: MDS, STV Revenues



Projections	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Households with TV Sets (MM)	74.2	75.8	77.7	79.2	80.7	82.2	83.7	85.2	86.7	87.5	88.7	89.8	91.2
Households where MDS/STV is available (MM) 1/	6.3	16.9	24.5	27.6	31.1	35.1	41.0	81.0	112.0	81.0	84.0	85.6	86.0
Households subscribing to MDS/STV (MM) 2/	.3	.7	1.3	1.5	1.7	2.1	2.4	2.8	3.3	3.9	4.6	5.4	6.4
% of all TV households	.4	.9	1.6	1.8	2.1	2.4	2.8	3.3	3.8	4.5	5.2	6.0	6.9
Pay TV services per Pay TV subscriber	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3
Monthly cost per Pay TV channel 3/	14.53	19.37	17.84	17.84	16.69	15.62	12.60	10.00	9.00	8.82	8.82	8.82	8.82
Total MDS/STV revenues from Pay TV (MM)	58	140	267	318	346	402	518	571	717	825	973	1143	1354

1. Based on MDS & STV industry operating data for 1978-1981 as reported in The Pay TV Census 1981 (Paul Kagan Associates, Carmel, California, 1981).

2. The long-term impact of MDS & STV competition with cable TV for Pay TV subscribers is only partly known. With two-channel MDS now being implemented on a experimental basis, the possibility of multi-channel MDS being discussed, and with two-channel STV also now being introduced, these technologies offer a strong prospect for vigorous competition with cable TV for non-interactive pay TV services.

3. Actual STV average monthly rates fell from $19.58/month in 1979 to $19.37 in 1980. MDS charges in the comparable period increased from $14.24 to $15.08. Because of competition from DBS cable TV, we anticipate STV & MDS rates to drop to totals comparable with DBS & cable television. We project monthly costs will drop to the average per pay cable channel charge in 1986, and will remain at 10% below this charge for 1987-1990.

THE ECONOMICS OF OVER-THE-AIR MULTI-CHANNEL VIDEO SYSTEM REGULATION

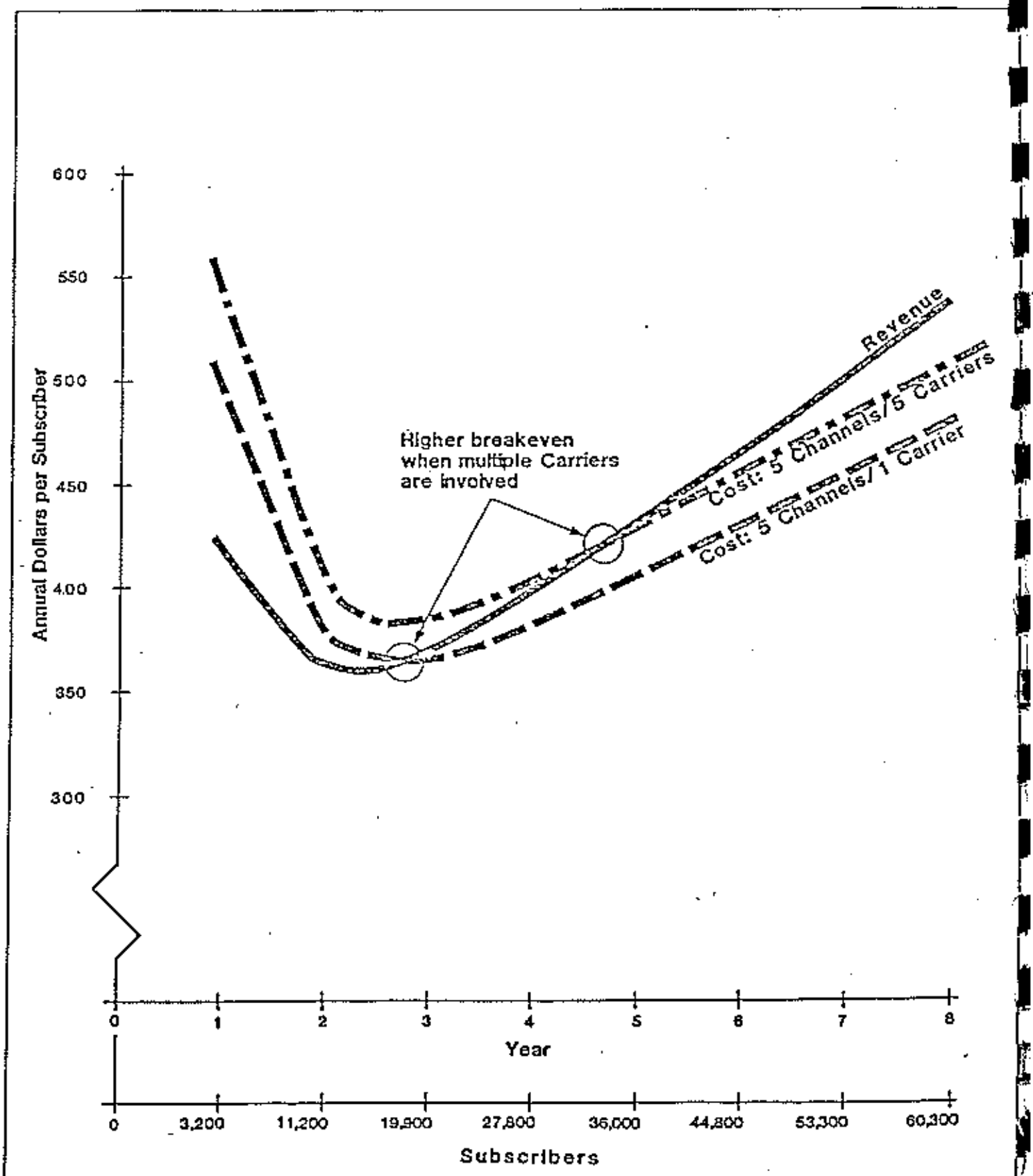
July 28, 1982

Prepared by:

Braden R. Allenby
of Walter Hinchman Associates

FIGURE 7

Economic Advantage of Multi-channel MDS Carriers



Applications of

CONTEMPORARY COMMUNICATIONS CORPORATION

For Developmental Authorizations

to Establish

Multi-Channel Systems (MCS)

in

New York
Chicago
Los Angeles
St. Louis
Philadelphia

Submitted to the
Federal Communications Commission

Counsel:

Richard O. Pullen, Esq.
M. Christina Selin, Esq.

Contemporary Communications
Corporation

Morgan E. O'Brien, Esq.

Becker, Gurman, Lukas, Meyers
& O'Brien, P.C.
2501 M Street, N.W.
Suite 400
Washington, D.C. 20037

Aug. 1982

Section III

FINANCIAL QUALIFICATIONS OF BROADCAST APPLICANT

NAME OF APPLICANT

CONTEMPORARY COMMUNICATIONS CORPORATION

The Commission is seeking in the questions that follow information as to contracts and arrangements now in existence, as well as any arrangements or negotiations, written or oral, which relate to the present or future financing of the station; the questions must be answered in the light of this instruction.

IF CONTEMPLATED EXPENDITURES ARE LESS THAN $5,000 AND THIS APPLICATION IS FOR A CHANGE IN AN EXISTING STATION, COMPLETE ONLY THIS PAGE OF SECTION III.

1 a. Given estimated initial costs of making installation for which application is made. If performed under a contract for the completed work, the facts as to such contract must be stated in lieu of estimates as to the several items. In any event, the cost shown must be costs in place and ready for service, including the amounts for labor, supervision, materials, supplies and freight. Cost items such as professional fees, mobile and STL equipment, non-technical studio furnishings, etc., should be included under "Other Items" below, and itemized.

	COLUMN I (USE ONLY WHEN ITEMIZING)	COLUMN II (TOTAL)
Antenna System: (Including antenna, antenna tower, transmission line, phasing equipment, ground system, coupling equipment and tower lighting.)	$	$ 21,500
RF Generating Equipment: (Including transmitter, tubes, filters, diplexer, remote control equipment, and automatic logger.)		822,500
Monitoring and Test Equipment: (Including frequency monitor, phase monitor, modulation monitor, oscilloscope, dummy load, vectroscope, video monitors.)		50,000
Program Origination Equipment: (Including control consoles, film chains, cameras, audio tape equipment, video tape equipment, program and distribution amplifiers, limiters, and transcription equipment.)		-
Acquiring Land:		-
Acquiring, Remodeling or Constructing Buildings:		40,000
Other Items: (Itemize Below)		
Legal Costs:	2,500	
Engineering Costs:	3,500	
Installation Costs:		
Other Miscellaneous:	15,000	
Total Other Items:		21,000
Total Construction Costs:		955,000
Add Estimated Cost of Operation for First Year.		108,907
Total First Year Costs To Be Met By Applicant:		1,063,907
Estimated Revenues For First Year:		189,000

Section III, Page 2 **Financial Qualifications**

Item 1 *(continued)*:

b. State the basis of the estimates in (a), Page 1, Section III, including (in the case of an application for a new broadcast station) complete itemization of cost of operation for the first year, including cost of proposed programming, as Exhibit III-1 to this application.

2. Attach as Exhibit III-2 a detailed balance sheet showing applicant's assets, liabilities and net worth and state fully the facts showing applicant's financial responsibility with respect to the construction and operation of the station.

EXHIBIT III-1

July 15, 1982

Cost estimates were obtained by sampling vendor price quotations for each item. No costs are included for programming because programming will be provided by our customer. Items included in first year operating costs are:

Site rental-transmitter	$ 9,000
Electricity	9,960
Maintenance	22,500
Tubes	19,600
Other maintenance material	5,000
Corporate overhead	42,847
	$108,907

Revenue estimates are based upon start-up at the beginning of the seventh month after a construction permit is issued, and are conservatively calculated to include only transmission revenues. Applicant also expects to earn subscriber revenues but is unable to estimate the amount of such revenues at this time.

Section III

FINANCIAL QUALIFICATIONS OF BROADCAST APPLICANT

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	COLUMN I (USE ONLY WHEN ITEMIZING)	COLUMN II (TOTAL)
Antenna System: (Including antenna, antenna tower, transmission line, phasing equipment, ground system, coupling equipment and tower lighting.)	$	$ 47,200
RF Generating Equipment: (Including transmitter, tubes, filters, diplexer, remote control equipment, and automatic logger.)		757,000
Monitoring and Test Equipment: (Including frequency monitor, phase monitor, modulation monitor, oscilloscope, dummy load, vectroscope, video monitors.)		50,000
Program Origination Equipment: (Including control consoles, film chains, cameras, audio tape equipment, video tape equipment, program and distribution amplifiers, limiters, and transcription equipment.)		-
Acquiring Land:		-
Acquiring, Remodeling or Constructing Buildings:		13,000
Other Items: (Itemize Below)		
Legal Costs:	2,500	
Engineering Costs:	-	
Installation Costs:		
Other Miscellaneous:	27,000	
Total Other Items:		29,500
Total Construction Costs:		896,700
Add Estimated Cost of Operation for First Year.		140,857
Total First Year Costs To Be Met By Applicant:		1,037,557
Estimated Revenues For First Year:		258,600

Section III, Page 2 **Financial Qualifications**

Item 1 *(continued)*:

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EXHIBIT III-1 July 15, 1982

Cost estimates were obtained by sampling vendor price quotations for each item. No costs are included for programming because programming will be provided by our customer. Items included in first year operating costs are:

Site rental-transmitter	$ 3,000
Electricity	18,600
Maintenance	22,500
Tubes	50,000
Other maintenance material	5,000
Corporate overhead	41,757
	$140,857

Revenue estimates are based upon start-up at the beginning of the seventh month after a construction permit is issued, and are conservatively calculated to include only transmission revenues. Applicant also expects to earn subscriber revenues but is unable to estimate the amount of such revenues at this time.

NY

Section III

FINANCIAL QUALIFICATIONS OF BROADCAST APPLICANT

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	COLUMN I (USE ONLY WHEN ITEMIZING)	COLUMN II (TOTAL)
Antenna System: (Including antenna, antenna tower, transmission line, phasing equipment, ground system, coupling equipment and tower lighting.)	$	$ 31,500
RF Generating Equipment: (Including transmitter, tubes, filters, diplexer, remote control equipment, and automatic logger.)		482,000
Monitoring and Test Equipment: (Including frequency monitor, phase monitor, modulation monitor, oscilloscope, dummy load, vectroscope, video monitors.)		50,000
Program Origination Equipment: (Including control consoles, film chains, cameras, audio tape equipment, video tape equipment, program and distribution amplifiers, limiters, and transcription equipment.)		-
Acquiring Land:		-
Acquiring, Remodeling or Constructing Buildings:		17,000
Other Items: (Itemize Below)		
Legal Costs:	2,500	
Engineering Costs:	-	
Installation Costs:	20,000	
Other Miscellaneous:		
Total Other Items:		22,500
Total Construction Costs:		603,000
Add Estimated Cost of Operation for First Year.		93,698
Total First Year Costs To Be Met By Applicant:		696,698
Estimated Revenues For First Year:		108,000

Section III, Page 2 — Financial Qualifications

Item 1 *(continued)*:

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EXHIBIT III-1 July 15, 1982

Cost estimates were obtained by sampling vendor price quotations for each item. No costs are included for programming because programming will be provided by our customer. Items included in first year operating costs are:

Site rental-transmitter	$ 12,000
Electricity	6,720
Maintenance	22,500
Tubes	11,200
Other maintenance material	5,000
Corporate overhead	36,278
	$ 93,698

Revenue estimates are based upon start-up at the beginning of the seventh month after a construction permit is issued, and are conservatively calculated to include only transmission revenues. Applicant also expects to earn subscriber revenues but is unable to estimate the amount of such revenues at this time.

Section III

FINANCIAL QUALIFICATIONS OF BROADCAST APPLICANT

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CONTEMPORARY COMMUNICATIONS CORPORATION

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	COLUMN I (USE ONLY WHEN ITEMIZING)	COLUMN II (TOTAL)
Antenna System: (Including antenna, antenna tower, transmission line, phasing equipment, ground system, coupling equipment and tower lighting.)	$	$ 84,000
RF Generating Equipment: (Including transmitter, tubes, filters, diplexer, remote control equipment, and automatic logger.)		936,000
Monitoring and Test Equipment: (Including frequency monitor, phase monitor, modulation monitor, oscilloscope, dummy load, vectroscope, video monitors.)		50,000
Program Origination Equipment: (Including control consoles, film chains, cameras, audio tape equipment, video tape equipment, program and distribution amplifiers, limiters, and transcription equipment.)		-
Acquiring Land:		-
Acquiring, Remodeling or Constructing Buildings:		39,000
Other Items: (Itemize Below)		
Legal Costs:	2,500	
Engineering Costs:	1,000	
Installation Costs:	32,000	
Other Miscellaneous:		
Total Other Items:		35,500
Total Construction Costs:		1,144,500
Add Estimated Cost of Operation for First Year.		110,328
Total First Year Costs To Be Met By Applicant:		1,254,828
Estimated Revenues For First Year:		216,000

Section III, Page 2 **Financial Qualifications**

Item 1 *(continued)*:

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EXHIBIT III-1

July 15, 1982

Cost estimates were obtained by sampling vendor price quotations for each item. No costs are included for programming because programming will be provided by our customer. Items included in first year operation costs are:

Site rental-transmitter	$ 3,000
Electricity	11,040
Maintenance	22,500
Tubes	22,400
Other Maintenance Material	5,000
Corporate overhead	46,388
	$110,328

Revenue estimates are based upon start-up at the beginning of the seventh month after a construction permit is issued, and are conservatively calculated to include only transmission revenues. Applicant also expects to earn subscriber revenues but is unable to estimate the amount of such revenues at this time.

STL

Section III

FINANCIAL QUALIFICATIONS OF BROADCAST APPLICANT

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	COLUMN I (USE ONLY WHEN ITEMIZING)	COLUMN II (TOTAL)
Antenna System: (Including antenna, antenna tower, transmission line, phasing equipment, ground system, coupling equipment and tower lighting.)	$	$ 64,000
RF Generating Equipment: (Including transmitter, tubes, filters, diplexer, remote control equipment, and automatic logger.)		709,000
Monitoring and Test Equipment: (Including frequency monitor, phase monitor, modulation monitor, oscilloscope, dummy load, vectroscope, video monitors.)		50,000
Program Origination Equipment: (Including control consoles, film chains, cameras, audio tape equipment, video tape equipment, program and distribution amplifiers, limiters, and transcription equipment.)		-
Acquiring Land:		-
Acquiring, Remodeling or Constructing Buildings:		-
Other Items: (Itemize Below)		
Legal Costs:	2,500	
Engineering Costs:	-	
Installation Costs:		
Other Miscellaneous:	31,000	
Total Other Items:		33,500
Total Construction Costs:		856,500
Add Estimated Cost of Operation for First Year.		97,186
Total First Year Costs To Be Met By Applicant:		953,686
Estimated Revenues For First Year:		162,000

Section III, Page 2 **Financial Qualifications**

Item 1 *(continued)*:

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EXHIBIT III-1 July 15, 1982

Cost estimates were obtained by sampling vendor price quotations for each item. No costs are included for programming because programming will be provided by our customer. Items included in first year operating costs are:

Site rental-transmitter	$ 3,000
Electricity	8,880
Maintenance	22,500
Tubes	16,800
Other maintenance material	5,000
Corporate overhead	41,006
	$ 97,186

Revenue estimates are based upon start-up at the beginning of the seventh month after a construction permit is issued, and are conservatively calculated to include only transmission revenues. Applicant also expects to earn subscriber revenues but is unable to estimate the amount of such revenues at this time.

Business Opportunities For Broadcasters In MDS Pay Television

BY
~~PETER FRANK~~
JOHN SHACKELFORD
MICROBAND CORPORATION OF AMERICA

Aug. 1982

COM/TECH REPORT
VOL. 1, NO. 2

TABLE 4

MDS System Staffing Levels

Function	Installations per month		
	300	500	1,100
Administration			
General Manager	1	1	1
Controller	1	1	1
Accounting & EDP Clerks	3	4	7
Sales			
Sales Manager	1	1	1
Customer Service Representatives	1	2	7
Sales	4	6	18
Operations			
Operations Manager	1	1	1
Service Supervisor	1	1	1
Dispatcher	1	1	2
Inventory Clerk	1	1	1
Technical Service	1	2	5
Installation	5	8	20
Total Personnel	21	29	65

TABLE 5

Single Channel MDS Pay TV Operation ($000s)

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	$ 1,277.8	$ 2,364.2	$ 2,541.4	$ 2,749.2	$ 2,956.5
Pretax Profit (Loss)	(659.0)	677.4	785.3	906.9	1,026.5
Cash Flow (after Taxes)	(1,152.1)	347.9	591.9	647.2	716.0

TABLE 6

Average Subscriber Acquisition Cost (Single Family Home)

Costs:	
Home Reception Equipment	$ 100.00
Sales	21.00
Advertising	24.00
Installation	30.00
Direct Cost to Acquire a Subscriber	$ 175.00
Installation fee	($ 49.95)
Net Investment per Subscriber	$ 125.05

TABLE 7

Subscriber Pay Back Period

Monthly Subscriber Fee	$ 19.95
Variable Costs:	
Programming	(7.00)
Carrier Connection Charge	(0.90)
Billing	(0.50)
Variable Profit	$ 11.55
Net Investment per Subscriber	$ 125.05
Pay Back Period	10.3 months

APPENDIX 2
Projected Financial Statements And Notes

The accompanying financial projection is based on the assumptions of the authors about the conditions and courses of action they believe to be reasonable in managing the construction and operation of a single channel MDS system. The financial projection has been prepared for purposes of illustration only. Local conditions prevailing in a specific market could differ substantially from the conditions assumed in this example. As a result, actual estimates could vary from the projection and the variation could be material.

TABLE 11

PROJECTED INCOME STATEMENT
SINGLE CHANNEL MDS PAY TV OPERATION
($000s)

	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues					
Subscription Fee	$ 788.3	$ 2262.6	$ 2370.6	$ 2478.6	$ 2586.6
Installation Fee	489.5	54.0	54.0	63.0	63.0
Interest Income	-0-	47.6	116.8	207.6	306.9
Total Revenues	$ 1277.8	$ 2364.2	$2541.4	$ 2749.2	$ 2956.5
Operating Costs					
Carrier	$ 135.1	$ 153.4	$ 153.4	$ 153.4	$ 153.4
Programming	276.5	801.0	849.4	900.4	954.4
Installation	296.2	31.3	32.7	34.0	35.5
Technical Service	66.7	38.9	40.8	42.9	45.0
Total Operating Costs	$ 774.5	$ 1024.6	$ 1076.3	$ 1130.7	$ 1188.3
Selling, General and Administrative Expense					
Sales	$ 205.9	$ 22.8	$ 23.7	$ 24.7	$ 25.7
Customer Service	87.1	36.5	38.3	40.2	42.2
Advertising	240.0	50.0	50.0	50.0	50.0
Administration	238.5	114.0	119.4	128.0	131.0
Facilities	201.4	109.8	114.7	119.9	128.3
Bad Debt Expense	31.5	90.5	94.8	99.1	103.5
Depreciation	157.9	238.6	238.9	249.7	261.0
Total S, G + A	$ 1162.3	$ 662.2	$ 679.8	$ 711.6	$ 741.7
Pretax Profit (Loss)	$ (659.0)	$ 677.4	$ 785.3	$ 906.9	$ 1026.5
Investment Tax Credit	105.3	4.7	5.0	5.2	5.5
Income Tax	329.5	(338.7)	(392.7)	(453.5)	(513.3)
Net Income	$ (224.2)	$ 343.3	$ 397.6	$ 458.6	$ 518.7

TABLE 12

PROJECTED CASH RECEIPTS AND CASH DISBURSEMENTS SINGLE CHANNEL MDS PAY TV OPERATION ($000s)

	Year 1	Year 2	Year 3	Year 4	Year 5
Beginning Balance	$ -0-	$ 50.0	$ 50.0	$ 989.8	$1637.0
Cash Receipts					
Accounts Receivable	$ -0-	$ 78.3	$ 226.3	$ 237.1	$ 247.9
Subscription Revenue	667.9	1945.8	2038.7	2131.6	2224.5
Installation Revenue	489.5	54.0	54.0	63.0	63.0
Interest Income	-0-	47.6	116.8	207.6	306.9
Capital Required	1152.1				
Total Cash Receipts	$2269.5	$2125.7	$2435.8	$2639.3	$2842.3
Cash Disbursements					
Operating Costs	$ 774.5	$1024.6	$1076.3	$1130.7	$1188.3
S, G + A Expense	1162.3	662.2	679.8	711.6	741.7
Less Depreciation and Bad Debt Expense	(189.4)	(329.1)	(333.7)	(348.8)	(364.5)
Increases in Inventory	30.0	(10.0)	(14.0)	0.3	0.3
Increases in Long Term Assets	1067.5	47.3	49.6	52.1	54.7
Decreases in Accounts Payable	(140.6)	48.8	(1.8)	(2.1)	(2.0)
Investment Tax Credit	(105.3)	(4.7)	(5.0)	(5.2)	(5.5)
Income Taxes (benefit)	(329.5)	338.7	392.7	453.5	513.3
Total Cash Disbursement	$2269.5	$1778.0	$1843.9	$1992.1	$2126.3
Cash Surplus	- 0 -	$ 347.9	$ 591.9	$ 647.2	$ 716.0
Ending Balance	$ 50.0	$ 397.9	$ 998.8	$1637.0	$2353.0

SUMMARY OF SIGNIFICANT ASSUMPTIONS

1. Revenues

Revenues are the result of the growth in subscribers reduced by subscriber turnover or churn. A turnover of 10% is projected which is consistent with a stable subscriber population composed primarily of single family homes. A greater mix of multi-unit dwellings or competitive incursions into the market by other pay TV distribution services would probably result in a higher turnover rate. This would necessitate higher marketing and installation expenses. For example, a turnover rate of 20% would require an estimated increased expense of $67,500 for additional installation and sales staff. The amount of additional advertising needed would depend on circumstances.

TABLE 13

FIVE YEAR PROJECTIONS

	Year 1	Year 2	Year 3	Year 4	Year 5
New Subscribers	9,800	900	900	900	900
Disconnects	(800)	(900)	(900)	(900)	(900)
Cumulative Subscribers	9,000	9,000	9,000	9,000	9,000
Average Subscribers	3,293	9,000	9,000	9,000	9,000
Monthly Subscription Fee	$ 19.95	$ 20.95	$ 21.95	$ 22.95	$ 23.95
Installation Fee	$ 49.95	$ 59.95	$ 59.95	$ 69.95	$ 69.95

Average number of subscribers in the first year total 3,293 rather than 4,500 as would be the case if subscribers were added evenly over twelve months. Subscriber growth will more likely be skewed towards the last half of the year. Interest income is earned at the rate of 15% per annum on surplus cash in years two to five.

2. Carrier

Carrier payments are based on monthly transmission charges of $4,600 and a monthly connection charge of $0.90 per subscriber. A one-time charge of $40,000 has been provided for in the first year to pay for the installation of two 100 watt amplifiers. An allowance has also been made for reimbursable expenses payable to the carrier of $4,400 in the first year and $1,200 in each succeeding year.

3. Programming

A monthly programming cost of $7 per subscriber has been projected with a 6% inflation rate assumed for succeeding years.

4. Installation

All personnel expenses assume a 5% annual inflation rate.

During peak installation periods, in the first year when over 1,100 installs per month are budgeted, twenty installers will be used. In succeeding years, when installation activity declines to an average of 75 installations per month, only two installers are required. Salaries, benefits and incentive payments are included as well as vehicle gas and maintenance. Vehicles themselves are not included.

5. Technical Service

Five service technicians are included in the first year projection with a reduction to two technicians in succeeding years. Salaries and benefits are included along with vehicle gas and maintenance. As with installation projections, vehicle capital costs are not included.

6. Sales

Sales personnel reach a total number of eighteen in the first year and drop to two in succeeding years. Salaries, benefits, and incentive payments are included.

7. Customer Service
Five customer service representatives are projected in the first year, declining to two in succeeding years. Salaries and benefits are shown.

8. Advertising
Advertising expense is projected at $240,000 in the first year and $50,000 in each succeeding year.

9. Administrative
Fifteen administrative personnel are included in the first year. In succeeding years, seven will be required. Salaries and benefits are included.

10. Facilities
Customer billing, rent for a 3,500 square foot office and warehouse, voice and data systems, utilities and maintenance, truck leasing and organizational expenses are included. Facility expenses decline in the second year primarily because of the elimination of truck leasing ($88,000) and lower telephone charges. These decreasing costs are partially offset by higher customer billing expense.

11. Bad Debt Expense
Four percent of accounts receivable are assumed to be uncollectible.

12. Accounts Receivable
Ten percent of subscription sales are assumed to be outstanding and collectible at the end of each year.

13. Inventory
Supplies of MDS reception equipment.

14. Capital Expenditures, Depreciation and Investment Tax Credits
Anticipated capital expenditures include initial expenditures of $36,500 for an office, service center and warehouse; $40,000 for a satellite earth station, installation equipment and electronic test equipment; and $36,000 for four trucks (additional trucks will be leased during the peak installation period). Other first year and subsequent years' capital expenditures relate to the acquisition of subscriber home reception equipment. Studio and studio-to-transmitter links (STL) are assumed to either not be required or already available.

The average cost of the home reception equipment is estimated at $100 in 1982 with a 5% inflation rate each year thereafter.

Depreciation expense has been computed using ACRS percentages over a five year useful life. It is expected that capital expenditures qualify for a 10% investment tax credit.

TABLE 14
PROJECTION OF CAPITAL EXPENDITURES
($000s)

	YEARS						
	1	2	3	4	5	6	7
Home Reception Equipment	$ 940.0	$ 47.3	$ 49.6	$ 52.1	$ 54.7	$ 57.4	$ 60.3
Other Capital Equipment	$ 127.5						
Total Capital Expenditures	$ 1067.5	$ 47.3	$ 49.6	$ 52.1	$ 54.7	$ 57.4	$ 60.3
Investment Tax Credit	$ 105.4	$ 4.7	$ 5.0	$ 5.2	$ 5.5	$ 5.7	$ 6.0

15. Accounts Payable
Payment within 30 days after invoicing is assumed for carrier, programming and facilities, as well as for additions to inventory and long term assets.

16. Taxes
Federal and state income taxes are assumed to be 50% of pretax income or loss. It is currently assumed that a tax benefit will be received for any available investment tax credits or losses which would offset taxes otherwise payable by affiliates of the MDS operation.

4-3

TABLE OF CONTENTS

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INDEX TO ADVERTISERS

PAY TV SUBSCRIBER HISTORY

Date	Pay-Cable Subs (mil)	MDS Subs (mil)	STV Subs (mil)	Total Pay Subs (mil)	(a) Basic Cable Subs (mil)	Homes Passed By Cable (mil)	(a) Homes Passed By MDS (mil)	Homes Passed By STV (mil)	(b) Total Homes Passed (mil)
4/01/73	.018			.018					
7/15/73	.035			.035					
2/01/74	.048			.048					
5/15/74	.067			.067					
9/01/74	.100			.100					
12/31/74	.140			.140					
3/31/75	.189			.189					
6/30/75	.265			.265					
9/30/75	.351			.351					
12/31/75	.469			.469	1.984	4.216			
3/31/76	.633	.024		.657	2.530	5.550	.111		5.661
6/30/76	.766	.028		.794	3.150	6.874	.134		7.008
12/31/76	.978	.043		1.021	4.370	9.191	.192		9.383
6/30/77	1.174	.065	.005	1.244	5.202	10.779	.305	.135	11.219
12/31/77	1.642	.071	.020	1.733	6.483	13.432	.371	.392	14.195
6/30/78	2.352	.091	.059	2.502	7.591	15.363	.457	1.500	17.320
12/31/78	3.289	.146	.145	3.580	9.397	18.338	.750	5.500	24.588
6/30/79	4.334	.207	.260	4.801	11.487	21.777	2.317	6.700	30.794
12/31/79	5.732	.278	.399	6.409	13.869	25.712	5.826	11.050	39.231
6/30/80	7.231	.352	.520	8.103	16.100	29.091	8.010	12.050	41.650
12/31/80	9.144	.447	.798	10.389	18.070	32.826	13.209	21.300	46.334
6/30/81	11.320	.479	1.082	12.881	20.500	37.300	13.503	22.800	48.910
12/31/81	15.502	.530	1.541	17.573	22.530	41.195	16.609	29.600	58.363
6/30/82	17.605	.570	1.747	19.922	24.600	44.500	18.288	30.900	61.200

Date	Pay-Cable % Pen of Homes Passed	Pay-Cable % Pen of Basic Cable	MDS Pay % Pen of Homes Passed	STV Pay % Pen of Homes Passed	(c) Average Pay-Cable Rate	(c) Average MDS Rate	(c) Average STV Rate	(c) Average Pay TV Rate
12/31/75	11.1%	23.6%			$7.85			
3/31/76	11.4	25.0	21.6%		7.49			
6/30/76	11.1	24.3	20.8		7.59			
12/31/76	10.6	22.3	22.3		7.87	$10.01		
6/30/77	11.0	22.5	21.3	3.7%	7.81	10.39	$14.98	$7.97
12/31/77	12.2	25.3	19.1	5.1	7.92	10.69	15.48	8.12
6/30/78	15.3	30.9	19.9	3.9	7.94	11.69	16.26	8.27
12/31/78	17.9	35.0	19.4	2.6	8.09	11.63	17.85	8.62
6/30/79	19.9	37.7	9.0	3.9	8.20	11.94	18.36	8.91
12/31/79	22.3	41.3	4.7	3.6	8.44	14.24	19.38	9.37
6/30/80	24.9	44.9	4.4	4.3	8.75	13.99	19.95	9.70
12/31/80	27.9	50.6	3.4	3.7	8.80	15.08	19.38	9.78
6/30/81	30.3	55.2	3.6	4.7	8.90	15.98	19.29	9.90
12/31/81	37.6	68.8	3.2	5.9	9.02	16.14	19.23	10.13
6/30/82	38.7	71.6	3.1	5.7	9.25	16.02	17.22	10.14

(a) Basic cable subscribers and homes passed by cable columns show number of basic cable subs and homes passed in those systems offering pay TV.

(b) Total homes passed for 1979 forward is PKA estimate of the unduplicated homes passed by systems offering pay TV. Prior to 1979 this number is the total of homes passed by systems offering pay TV, STV and MDS (column 6+7+8).

(c) Average rates are determined by dividing revenues from all subscribers by the number of subscribers.

STATISTICAL PROGRESS OF MDS

Date	Cities with MDS applications or permits	Companies Operating/ Applying	Operating Stations	Licensed, But not Operating	Other Permits Granted	Applications Pending	Mutually Exclusive Applications
6/30/82	463	222	85	119	147	494	325
12/31/81	448	203	73	107	149	581	401
6/30/81	434	185	69	63	155	690	471
12/31/80	420	180	59	48	147	707	500
6/30/80	375	158	57	37	122	620	427
12/31/79	301	138	49	33	76	517	380
6/30/79	281	125	42	25	66	510	359
12/31/78	258	115	41	21	68	505	301
6/30/78	235	116	35	21	74	371	293
12/31/77	227	113	29	22	89	358	290
6/30/77	219	113	22	16	94	389	311
12/31/76	220	110	21	8	72	455	439
6/30/76	210	105	17	5	65	480	445
12/31/75	190	100	12	5	58	480	460
6/30/75	169	96	11	3	51	483	461
12/31/74	170	95	8	2	32	484	446
6/30/74	177	n/a	4	2	18	402	320
12/31/73	184	n/a	—	—	23	360	314
6/30/73	184	n/a	—	—	23	359	314
12/31/72	175	n/a	—	—	12	344	275
6/30/72	123	n/a	—	—	—	224	n/a

n/a — data not available

Data compiled by Paul Kagan Associates, Inc. from FCC filings

TABLE OF MDS TARIFFS

Market	Class B Monthly Charges
* Abilene, TX	$2,500 + 65¢/terminal (u)
Akron, OH	2,500 + 65¢/terminal
* Akron, OH	2,500 + 65¢/terminal (u)
* Albany, GA	2,500 + 65¢/terminal (u)
Albuquerque, NM	3,500 + 65¢/terminal
Allentown, PA	1,900 + 35¢/terminal
* Amarillo, TX	3,500 + 65¢/terminal
* Anaheim, CA	3,400 + $1.00/terminal (4200 min) + $500 tower charge
Anchorage, AK	3,000 + $2,000 for studio to MDS transmission
* Ann Arbor, MI	3,500 + 65¢/terminal
* Asheville, NC	2,500 + 65¢/terminal (u)
Astoria, OR	$2.00/sub (min $1600/mo)
* Atlanta, GA	2,500 + 20¢/terminal + $100 tower charge
Atlantic City, NJ	2,500 + 65¢/terminal (u)
* Austin, TX	2,500 + 65¢/terminal (u)
Bakersfield, CA	2,000 + 50¢/terminal
Baltimore, MD	4,500 + 65¢/terminal
* Beaumont, TX	3,500 + 65¢/terminal
Bellingham, WA	1,900 + 35¢/terminal
* Birmingham, AL	2,500 + 65¢/terminal + $500 tower charge (u)
* Boise, ID	2,500 + 65¢/terminal (u)
* Boston, MA	3,775 + 65¢/terminal
* Bridgeport, CT	2,500 + 65¢/terminal (u)
* Brownsville, TX	3,500 + 65¢/terminal
Buckhorn Lakes, CO	2,400 + $4.50/terminal + addl 50¢/yr each of next 5 years (u)
Buffalo, NY	3,500 + 65¢/terminal
Burlington, IA	1,300 + 25¢/home + $725 earth station
* Butte, MT	2,500 + 65¢/terminal (u)
Carthage, MO	$4.00/home + $325 earth station
* Cedar Rapids, IA	2,500 + 65¢/terminal (u)
Charleston, SC	2,500 + 65¢/terminal (u)
* Charlotte, NC	3,500 + 65¢/terminal
* Charlottesville, VA	2,500 + 65¢/terminal (u)
Chicago, IL	11,935/mo + 50¢/terminal
Cincinnati, OH	2,500 + 65¢/terminal
* Cincinnati, OH	2,500 + 65¢/terminal (u)
Clayton, CA	1,500 + 65¢/terminal (over 1000) (u)
* Cleveland, OH	3,260 + 20¢/terminal + $1260 tower charge
Colorado Spgs, CO	3,500 + 65¢/terminal
Columbia, SC	2,500 + 65¢/terminal (u)
* Columbus, GA	2,500 + 65¢/terminal (u)
* Columbus, OH	2,500 + 65¢/terminal (u)
* Corpus Christi, TX	3,500 + 65¢/terminal
Davenport, IA	2,500 + 65¢/terminal (u)
* Dayton, OH	2,500 + 65¢/terminal (u)
* Denver, CO	2,950 + 20¢/terminal + $75 tower charge
* Des Moines, IA	2,100 + 50¢/terminal
* Detroit, MI	3,500 + 65¢/terminal
* Duluth, MN	2,500 + 65¢/terminal (u)
El Paso, TX	4,500 + 85¢/terminal
Elburn, IL	1,900 + 65¢/terminal
Ely, NV	$1.00/mo/terminal (min 500)
Erie, PA	1,500 + 65¢/terminal
* Evansville, IN	3,500 + 65¢/terminal
Fairbanks, AK	6,000 + $1.00/terminal (after 2000) (not eff until 3000 subs)
* Fargo, ND	2,500 + 65¢/terminal (u)
* Flint, MI	3,500 + 65¢/terminal
* Ft. Wayne, IN	2,500 + 65¢/terminal (u)
* Gainesville, FL	3,500 + 65¢/terminal
* Galveston, TX	3,500 + 65¢/terminal
Gilroy, CA	1,300 + 75¢/terminal (u)
* Grand Rapids, MI	2,500 + 65¢/terminal (u)
Hammond, LA	2,000 + 50¢/terminal
* Hartford, CT	3,500 + 65¢/terminal
* Hector, NY	1,500 + 65¢/terminal over 1000
* Helena, MT	2,500 + 65¢/terminal (u)
* Huntsville, AL	2,500 + 65¢/terminal (u)
* Indianapolis, IN	3,500 + 20¢/terminal + $410 tower charge
* Jackson, MS	2,500 + 65¢/terminal (u)
Jacksonville, FL	2,000 + 65¢/terminal (u)
* Johnson City, TN	2,500 + 65¢/terminal (u)
* Kalamazoo, MI	3,500 + 65¢/terminal
* Kansas City, MO	3,500 + 65¢/terminal + $225 tower charge
* Kearney, NE	1,585 + 65¢/terminal
* Lafayette, LA	3,500 + 65¢/terminal
* Lansing, MI	2,500 + 65¢/terminal (u)
* Lawton, OK	2,500 + 65¢/terminal (u)
* Lexington, KY	2,500 + 65¢/terminal (u)
Long Island, NY	2,000 + 65¢/terminal (u)
* Los Angeles, CA	4,200 + $1.00/terminal (4200 min) + $290 tower charge
* Louisville, KY	2,500 + 65¢/terminal + $800 tower charge (u)
* Lubbock, TX	2,500 + 65¢/terminal (u)
Macon, GA	1,400 + 95¢/1st 5,000 terminals; $1.15 next 5,000; $1.35 over 10,000 (u)
* Manchester, NH	2,500 + 65¢/terminal (u)
* Mansfield, OH	2,500 + 65¢/terminal (u)
* McAllen, TX	3,500 + 65¢/terminal
* Memphis, TN	3,750 + 65¢/terminal + $250 tower charge
* Miami, FL	3,000 + 82¢/terminal (u)
* Midland, TX	3,500 + 65¢/terminal
* Milwaukee, WI	3,500 + 20¢/terminal
Minneapolis, MN	3,650 + 95¢/terminal
* Minneapolis, MN	3,500 + 20¢/terminal
Mobile, AL	2,500 + 65¢/terminal
Monterey, CA	1,250 + 50¢/terminal
* Montgomery, AL	2,500 + 65¢/terminal + $75 tower charge (u)
* Muncie, IL	2,500 + 65¢/terminal (u)

* Microband carrier

(u)—Unprotected service

Market	Class B Monthly Charges
Naga Head, NC	1,500 + 50¢/terminal
Nashville, TN	2,500 + 65¢/terminal (u)
New Haven, CT	2,500 + 65¢/terminal (u)
*New Orleans, LA	3,570 + 30¢/terminal + $1,978 tower charge
*New York, NY	5,400 + 85¢/terminal (2700 min)
*Norfolk, VA	2,500 + 65¢/terminal + $200 tower charge (u)
Oklahoma City, OK	3,300 + 65¢/terminal + $100 tower charge
Olympia, WA	1,400
*Omaha, NE	3,500 + 65¢/terminal + $270 tower charge
Orlando, FL	2,500 (u)
Oro Grande, CA	1,900 + 80¢/terminal (u)
Oxnard, CA	2,000
*Palo Alto, CA	3,385 + 65¢/terminal
*Panama City, FL	2,500 + 65¢/terminal (u)
Payette, ID	4,000 min; $6 per drop
Pensacola, FL	2,500 + 65¢/terminal (u)
Peoria, IL	2,500 + 65¢/terminal (u)
Philadelphia, PA	12,400 + $1.00/home up to $16,400 maximum
Phoenix, AZ	2,500 + 65¢/terminal
*Phoenix, AZ	2,950 + 80¢/terminal
*Pittsburgh, PA	3,500 + 20¢/terminal
Pompano Beach, FL	2,500 + 65¢/terminal (u)
*Pontiac, MI	2,500 + 65¢/terminal (u)
*Portland, ME	2,500 + 65¢/terminal (u)
*Portland, OR	3,000 + 65¢/terminal + $300 tower charge
*Providence, RI	3,775 + 65¢/terminal
*Pueblo, CO	2,500 + 65¢/terminal (u)

Market	Class B Monthly Charges
*Reading, PA	2,500 + 65¢/terminal (u)
Reno, NV	2,750 + 65¢/terminal
Richmond, VA	2,500 + 25¢/terminal
Roanoke, VA	2,500 + 65¢/terminal (u)
*Rochester, MN	2,500 + 65¢/terminal (u)
Rochester, NY	3,500 + 65¢/terminal
St. Croix, VI	2,500 + $1.00/terminal
*St. Joseph, MO	2,500 + 65¢/terminal (u)
*St. Louis, MO	3,500 + 62.5¢/terminal
St. Thomas, VI	2,500 + $1.00/terminal
*Sacramento, CA	3,500 + 50¢/terminal
*Saginaw, MI	2,500 + 65¢/terminal (u)
*Salem, OR	2,500 + 65¢/terminal (u)
Salt Lake City, UT	$60/day + 50¢/terminal
San Bernardino, CA	2,500 + 65¢/1st 5,000 terminals; 55¢ next 10,000; 50¢ over 15,000 (u)
San Diego, CA	$125/hr + 50¢/terminal
*San Francisco, CA	3,775 + 65¢/terminal
San Juan, PR	1,000 + 75¢/1st 1,000; $1.75 next 1,000; 75¢ thereafter (u)
San Marcos, CA	2,500 + 65¢/1st 5,000 terminals; 55¢ next 5,000; 50¢ thereafter (u)
Sarasota, FL	2,500 + 65¢/terminal (u)
*Savannah, GA	2,500 + 65¢/terminal (u)
*Seattle, WA	3,000 + 65¢/terminal + $600 tower charge
*Sioux Falls, SD	2,500 + 65¢/terminal (u)
Soldotna, AK	4,000 min + $6.00/drop
*South Bend, IN	2,500 + 65¢/terminal (u)
*Spokane, WA	3,500 + 65¢/terminal
*Springfield, MA	3,775 + 65¢/terminal
*Springfield, MO	3,500 + 65¢/terminal
*Stockton, CA	3,500 + 50¢/terminal (u)
Tacoma, WA	2,000 + 65¢/terminal (u)
Tallahassee, FL	2,500 + 65¢/terminal (u)
Tampa, FL	2,000 + 65¢/terminal (u)
*Topeka, KS	2,500 + 65¢/terminal (u)
*Tulsa, OK	2,500 + 65¢/terminal (u)
Tupelo, MS	1,400 + 50¢/terminal
*Washington, D.C.	3,400 + 95¢/terminal
*Waterloo, IA	3,500 + 65¢/terminal
West Palm Beach, FL	2,500 + 65¢/terminal (u)
*Wheeling, WV	2,500 + 65¢/terminal (u)
*Wichita, KS	2,500 + 65¢/terminal (u)
*Wichita Falls, TX	3,500 + 65¢/terminal
Winnemucca, NV	$1.00/mo/terminal (500 min)
*Worcester, MA	2,000 + 65¢/terminal (u)
Yakima, WA	$1.00/terminal ($975 min)
*Youngstown, OH	2,500 + 65¢/terminal (u)

Other Microband Tariffs:

Class B Partial:	$1,200/mo.
Class B Package:	2,500/mo. + $150/term
Class Y:	500/mo. or 26¢/term (whichever is greater)
Class Z Preemptible:	300/mo.

* Microband carrier

(u)—Unprotected service

MDS UNDERCUTS CABLE PROFITS

by Diane Hinte
National Sales Manager, MDS Division,
Standard Communications

It appears these days that MDS (multipoint distribution service) is starting to give cable and STV a run for their money!

Up until recently, MDS has been a one channel service enabling MDS operators to offer first run movies or other types of entertainment to a vast audience not being served by cable or other forms of pay services.

Transmitted over the air via microwave, MDS is strictly line of site. Therefore, signals cannot always reach some areas intended to be served. It has been pushed aside by many other services, ignored by some programmers and not looked at seriously by most financial institutions.

Only five years old and MDS is alive and well! The persistence of the industry has brought about 24-hour MDS service, public offerings, better equipment, more program suppliers and NAMSCO, an association serving the needs of its industry.

With 85 operations serving some 570,000 subscribers, we've only creased the tip of the iceberg.

Time and time again, MDS proves to be an inexpensive alternative to pay programming and continues to be profitable at a much lower subscriber rate than other pay TV services.

If managed properly, the payback could be less than three years. There is less risk, less capital investment and the return is greater then other pay services.

With this kind of opportunity for the future, a new challenge is ahead for this small, but aggressive service.

In 1980, the FCC proposed a reshuffling of existing frequency assignments that would result in 11 ITES channels (instructional television fixed service); 10 OFS channels (operational fixed service): and 10 MDS channels. The allocations could change any given market according to the need, under the FCC plan.

Until now, these proposed dockets (80-112&113) have been somewhere in the FCC sitting idle, but not the MDS industry.

A recent report indicates that cable now passes less than a third of television homes. It would cost approximately $19 billion to build new cable systems or rebuild old ones and 30 million homes, many in urban areas, will still remain unwired in 1990.

Multichannel MDS however, could be completed within 24 months at a cost of no more than $35 million, sources say.

A multichannel MDS system could compete financially with a cable system. With a charge to the average subscriber of $28 per month at start-up, a cable system receives a return equity of 11.3%. In a typical situation, a multichannel MDS operator could charge his subscribers about 10% less and still get a return on equity of about 35%.

With this in mind, an experimental grant was obtained in 1981 by the common carrier in Salt Lake City, Channel View. They were given authorization to experiment with transmission and reception of an 8-channel MDS system with the idea of proving or disproving the viability by a single source.

Today, utilizing 48 MHz of the microwave spectrum with part of ITFS, eight channels of MDS is being transmitted over the air with equipment supplied by several MDS equipment suppliers. According to Dick Vail of Channel View, "We're doing for $850,000, what it would take an MSO $25,000,000 to duplicate."

Microband Corporation of America, the largest common carrier in the U.S., recently filed for a "wireless cable system" that would provide up to 14 common carrier channels in each of the top 50 markets. The second largest common carrier, Contemporary Communications, announced a joint venture with CBS for "multiple channel systems (MCS)" in five markets ranging from four to eight channels.

Contemporary Communications is looking at a three year developmental authorization to offer multiple channels at a cost of $4.5 million with CBS primarily functioning as a program supplier for this new venture.

As of this writing, lobbying is being done at the FCC for passage of multichannel MDS, by both the common carriers and the operators. They are working together and hopeful for a decision before the end of this year.

Salt Lake City is proving that technically it can be done. The community is proving that it is anxious to have its program needs satisfied without having to wait for cable to reach them.

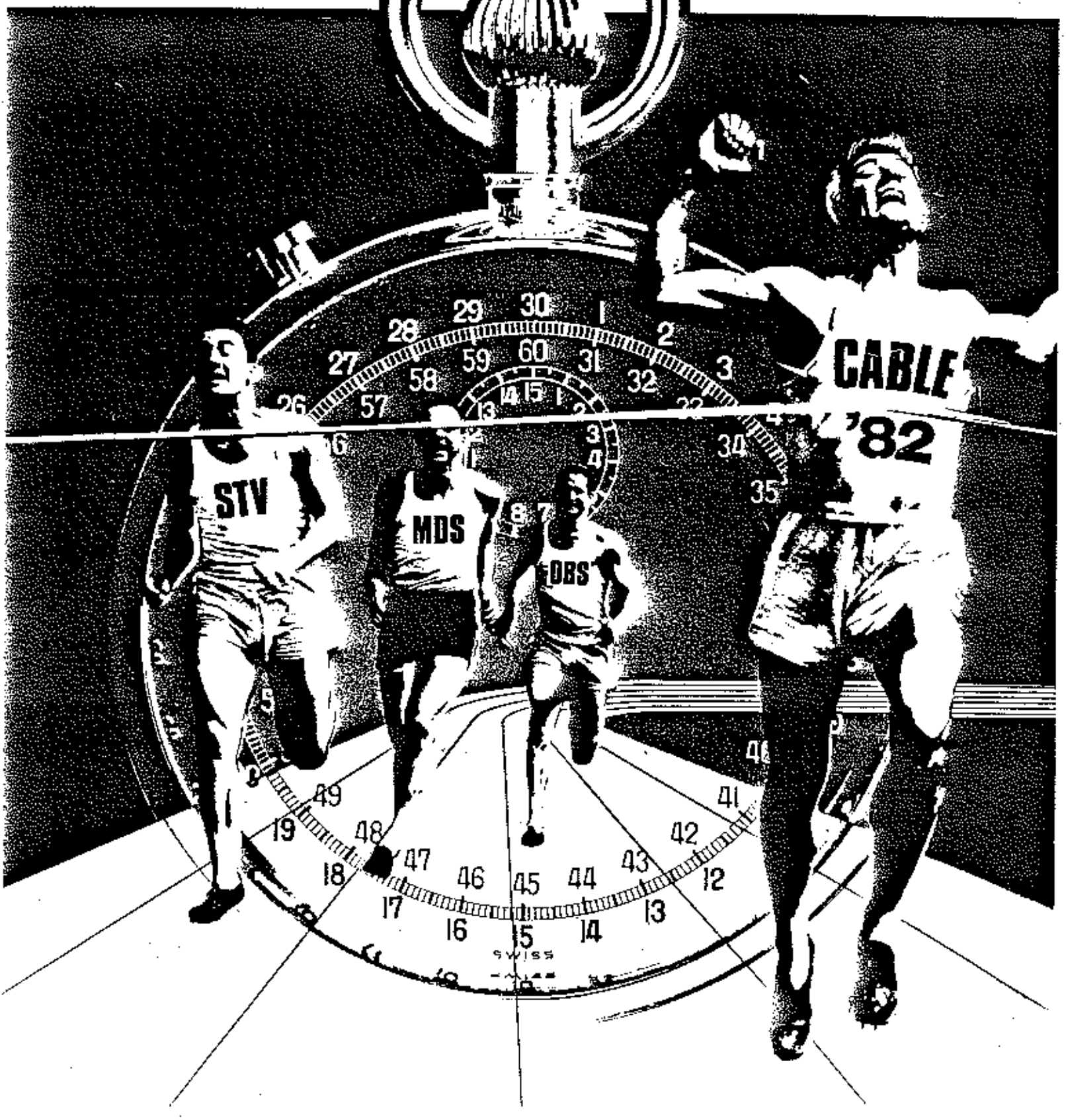
Donaldson, Lufkin & Jenrette

Donaldson, Lufkin & Jenrette Securities Corporation 140 Broadway, New York, N.Y. 10005 (212) 902-2000

49

Industry Viewpoint

OCTOBER, 1982



Star Wars release pattern

June 1982 - Videocassette rental-only plan
Summer 1982 - Videocassette sales plan
Summer 1982 - Theatrical re-release
September 1982 - Pay per view
February 1983 - Pay cable
February 1984 - CBS-TV

There aren't many "Star Wars" obviously, but a number of films may be handled this way in the future. In looking at the sequence, one will note the placement of pay per view after videocassettes and before pay cable. The post-video cassette release reflects a fear of taping off cable; the pre-HBO distribution the fact that whatever its cut, the income per viewer to Fox on a pay-per-view basis will be substantially greater than what it gets from pay cable. The studio has reportedly sold "Star Wars" to Showtime, The Movie Channel, and Spotlight for a $1.00-1.25 or more per subscriber; but HBO still hasn't bought.

Anyway, additional experiments are going on in pay per view at the system level. Group W Cable is testing films in its addressable system, in Middletown, Connecticut, for $3 a shot. Gill Cable's Bay Area interconnect is doing likewise and regularly drawing 15-20% response rates. Rogers' Portland, Oregon system is showing two movies a month, priced at $4 to $8 each.

The real catalysts, however, will be the emergence of distribution networks and the availability of addressable boxes.

On the first point, Oak Media has been formed to distribute events to STV and cable. The well-known prizefight promoter, Don King, has organized a venture, as well. The bigger moves, however, are most likely yet to come. One is likely to be a consortium headed by ABC. After previously announcing a deal to organize pay-per-view sports offerings with Getty's ESPN, ABC has also joined with Cox Cable in planning pay per view offerings, initially on Cox Systems. Rumblings suggest that ABC is soliciting other pay-per-view partners, presumably in cable or STV with subscriber bases as the attraction and/or with film studios. Plans for ABC to distribute Don King's fights have also been rumored.

At Time Inc., the purchase of the advertising-supported USA Network brought with it partnerships with MCA and Paramount. These were to include a pay-per-view network as well. MCA is,

however, distributing "Pirates of Penzance" on its own, and that studio and Paramount were negotiating to become partners in Warner/Amex's "The Movie Channel," which might make their relationship with HBO-parent Time Inc. somewhat questionable.

The wide-ranging discussions between CBS and Twentieth Century Fox undoubtedly also encompass the pay-per-view question. We would also suspect that Showtime and the other film studios have had talks. Viacom's recent convertible debenture prospects states that it is negotiating with third parties to resell the Showtime half that it is buying back from Westinghouse, or more than 50% of that network, as noted.

The role of the studios is important for other than the immediately obvious reason. For one, pay per view is likely to be a medium of exclusive events per network, unlike present-day pay cable; second, the studios have vowed to never again let a medium arise that is dependent on their product without their having some control and profit participation in the program distribution networks (as opposed to their situation vis a vis the television networks and HBO, in particular.) In fact, it isn't actually certain that they can't deal directly with cable/STV operators. Yet, since pay per view is likely to consist of more than just films and involve network scheduling, promotion and even the creation of events, there would appear to be the need for a packager. Furthermore, as in the case of pay cable, it is difficult to deal with thousands of individual cable systems, though the bulk are increasingly concentrated among a relative few MSOs.

ABC reportedly sounded out the cable industry on some pay-per-view ideas last fall, but the industry felt that ABC didn't yet have enough real events to sustain even a once a month schedule. Of course, that is partly a matter of pricing too. Over the past year, we gather the idea has formed of offering a greater variety of events, plays, concerts, and movies. Still, if ABC has had trouble coming up with a year's worth of product and product is likely to be exclusive, it raises the question of how multiple networks will survive. One answer might be higher subscriptions through the Qube approach of constantly available fare. Still, that probably is impractical without two-way boxes, and only Warner/Amex and a few systems roped in by franchise promises are likely to install two-way devices over the foreseeable future.

In any event, in looking at it from the cable operator's viewpoint, we can make a couple of observations: (1) Pay per view ought to produce at least a couple of dollars a month per subscriber, with Qube's $8-10 a likely ceiling for now, because the impulse nature permitted by Qube's two-way equipment won't be available initially to most cable subscribers. While Qube offers all the major pay-per-view events available to cable and STV, it also constantly provides at much lower prices products that would probably not be feasible on a one-way basis. (2) Profit margins will probably be lower than on a conventional pay service. While things are still in the formative stage, the promoters and/or product suppliers are looking for box office type cuts of 50% or more; and those figures do not yet allow a spread for a middleman. The latter could range upwards from 10%, we would guess. (3) There will also be promotional costs involved that exceed pay cable's since events have to be promoted individually. Although much of this may occur at the network level, local expenditures are also likely to exceed those on the present pay cable channels.

Next year ought to be the breakout year for pay per view. The number of events scheduled by various promoters is nearly up to one a month already and addressable decoder shipments are accelerating. The organization of pay networks will probably occur over the next 12 months as well.

If supplier estimates of 2 million or more addressables annually are finally met, the industry ought to have at least 5 million potential pay-per-view customers by the end of 1984, excluding systems using disposable traps.

As noted, cable subscription to pay-per-view events has consistently trailed STVs. A good deal of the discrepancy has to do with relative efficiency of promotion, since STV does not have the benefit of impulse buys of two-way, which could be the other logical explanation.

While pay-per-view penetration ratios of various events could quite likely range from under 10% to STV's 50% plus for really big fights, let us assume that a 25% average can be sustained. Let us further figure average retail prices at $7.50, reflecting a range from $5 films to $15 special events. Figuring that there might be enough profit to sustain twice-a-month showings by 1985 (between films, plays, concerts, sporting events and staged events), pay per view at retail would be a $225-million business at that point. That works out to $0.50 per average basic industry subscriber in 1985, the figure we incorporated into our 1985 forecast of monthly pay rates from pay cable in Table 7. Looking at it another way, it would represent $3.75 a month more from customers in systems with addressable (mostly one-way) decoders.

We touched on the issue of the possible effect of pay per view on conventional monthly subscriptions in discussing our understanding of the Qube experience. In that case, the influence is indiscernible, judging by still-high pay/basic penetration rates and pay-per-view income of $8 to $10 a month. As noted, however, the Qube system is two-way, encouraging impulse buying.

From an economic standpoint, the basic services offer 25 to 30 films a month at $8 or about $0.30 each, so they remain far more attractively priced than the pay-per-view product. That most likely means the latter will not displace the former. Yet, it also means that pay-per-view events will have to be special or relatively cheap, or both, to be profitable.

By 1990 we assume that at least two-thirds of industry subscribers have access to pay per view, e.g. that given its likely economic potential all but the smaller systems where pay response is usually lower will have upgraded to addressability. We also figure that, where available, pay per view can generate $9 a month, or the equivalent of another of today's pay channels. More events, more promotional spending, development of events for pay per view including nonentertainment product, growth in two-way systems, and expansion in real income are among the reasons that we think this will happen. What we are really trying to say is that there would appear to be the potential to sell a cable customer the equivalent of another pay channel, from a budget standpoint, and that whatever the route, entrepreneurs will be able to deliver product to tap the market to this degree. Given the history of cable (pay cable, which only began in earnest in 1975, is now available to more than 95% of cable subscribers), we think that this forecast is more likely to prove conservative than overly optimistic.

With two-thirds of our 53.5-million average 1990 subscribers paying $9 a month on average from special events, pay per view would be a $4-billion business, and cable's biggest nontraditional source of income.

AN ANALYSIS OF THE TELEVISION PROGRAMMING MARKET

- Prepared for -

American Broadcasting Companies, Inc.

- Prepared by -

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January 1983

TABLE B-6. PROJECTED OVER-THE-AIR PAY TELEVISION HOUSEHOLDS
1981-82 THROUGH 1989-90
(HOUSEHOLD FIGURES IN THOUSANDS)

	U.S.	STV		MDS		DBS		Other--Non-Scheduled(5)		SMATV		LPTV		Total Over-the-Air Pay Television	
Year	TV Households(1)	House-holds(2)	Pene-tration	House-holds(3)	Pene-tration	House-holds(4)	Pene-tration	House-holds	Pene-tration	House-holds(6)	Penetra-tion	House-holds(7)	Pene-tration	House-holds	Pene-tration
1981-82	81,937	1,319	1.6%	530	.6%	--	--	--	--	50	.06%	--	--	1,899	2.3%
1982-83	83,739	1,400	1.7	570	.7	--	--	--	--	100	.1	5	.01	2,075	2.5%
1983-84	85,200	1,600	1.9	870	1.0	170	.2%	80	.1%	300	.4	20	.02	3,040	3.6
1984-85	86,700	1,700	2.0	1,170	1.3	900	1.0	310	.4	400	.5	50	.1	4,530	5.2
1985-86	88,200	1,800	2.0	1,400	1.6	1,200	1.4	690	.8	500	.6	100	.1	5,690	6.5
1986-87	89,800	1,700	1.9	1,700	1.9	1,700	1.9	1,100	1.2	500	.6	200	.2	6,900	7.7
1987-88	91,400	1,600	1.8	2,000	2.2	2,500	2.7	1,400	1.5	500	.5	300	.3	8,300	9.1
1988-89	93,000	1,400	1.5	2,200	2.4	3,700	4.0	1,650	1.8	500	.5	600	.6	10,050	10.8
1989-90	94,700	1,200	1.3	2,300	2.4	5,400	5.7	1,850	2.0	500	.5	1,000	1.1	12,250	12.9

Sources:

(1) U.S. TV households for 1981-82 and 1982-83 are from A.C. Nielsen, U.S. Television Household Estimates, various issues. Projected TV households for 1984-85 and 1989-90 are A.C. Nielsen projections as of January 1. Remaining years are BBC estimates based on a constant percentage increase per year.

(2)(3)(4)(6)(7) STV households for 1981-82 and 1982-83 are from Paul Kagan & Associates, Pay TV Newsletter, April and October 1982 respectively. MDS television households for 1981-82 and 1982-83 are from Paul Kagan & Associates, MDS Data Book, October 1982. DBS, SMATV and LPTV television households are BBC estimates.

(5) These are "equivalent households" used for methodological purposes. Total households using these modes could be many times higher. However, given the ability of the household to self-schedule this programming, the expected impact on network viewing will likely be much less than in pay TV households. In addition, many VCR and disc users will also take a pay television service. To avoid double counting and to account for the different patterns of uses, BBC used an "equivalent" figure substantially below the total number of households using cassettes and discs.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of 47 CFR § 73.658(j); the Syndication and Financial Interest Rule	)	BC Docket No. 82-345
	)	
	)	

To: The Commission

COMMENTS OF CBS INC.

VOLUME I

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January 26, 1983

TABLE 1

Status of Video Outlets: 1982

		CABLE					
		Percentage of Homes Passed	Average Number of Channels	MDS Channels	Total UHF & VHF Channels	Video Cassette Recorders	Radio Stations
1.	New York	40%	31	3	14	392,800	39/78
2.	Los Angeles	24	24	5	18	253,548	32/73
3.	Chicago	5	34	2	12	181,676	39/67
4.	Philadelphia	29	28	6	11	146,239	30/44
5.	San Francisco	64	27	3	12	119,786	28/52
6.	Boston	23	25	3	9	115,294	21/50
7.	Detroit	5	31	3	8	101,818	23/38
8.	Washington, D.C.	9	27	1	9	89,840	20/40
9.	Cleveland	30	27	3	6	85,348	21/32
10.	Dallas-Ft. Worth	2	38	2	9	83,351	20/39
11.	Pittsburgh	49	15	1	8	74,867	22/37
12.	Houston	25	26	2	5	78,360	26/35
13.	Minneapolis-St. Paul	5	29	1	6	66,881	27/35

TABLE 1 (Continued)

Status of Video Outlets: 1982

	CABLE					
	Percentage of Homes Passed	Average Number of Channels	MDS Channels	Total UHF & VHF Channels	Video Cassette Recorders	Radio Stations
14. St. Louis	4	22	1	6	62,888	21/37
15. Seattle-Tacoma	41	23	3	7	66,382	26/47
16. Atlanta	12	35	1	6	66,382	23/32
17. Miami	28	35	2	9	67,879	17/37
18. Tampa-St. Petersburg	44	21	2	8	57,398	13/33
19. Baltimore	14	30	1	6	52,906	22/28
20. Denver	2	27	1	5	53,405	22/32
21. Indianapolis	19	23	2	7	48,913	20/24
22. Sacramento	23	21	2	6	49,911	18/24
23. San Diego	79	32	2	4	42,424	19/34
24. Portland	2	18	3	5	48,414	24/33
25. Kansas City	37	29	1	6	42,424	16/31

TABLE 2

Availability and Use Of Electronic Mass Media (Millions): 1970-1990

	1970	1975	1980	1982	1986	1990
Number of TV Households	59	70	78	83	90	97
Basic Cable						
Homes with Access	9	20	35	45	75	82
Subscribers	5	11	19	28	41	58
Pay Cable						
Homes with Access	-	4	26	42*	70*	76*
Subscriptions	-	.5	9	23	46	65
STV & MDS						
Homes with Access	-	3	22	35	49	59
Subscribers	-	NA	1	3	6	8
Low Power TV						
Homes with Access	-	-	-	NA	.4	10
Subscribers	-	-	-	NA	.36	.8
Direct Broadcast Satellite						
Homes with Access	-	-	-	-	72	97
Subscribers	-	-	-	-	2	11

* In 1982, 93% of the television households passed by basic cable had access to at least one pay cable service. Assuming that the basic-to-pay ratio remains constant through 1990 (a conservative estimate given the anticipated expansion in channel capacities, see supra note 106), pay cable will be available to 70 million households in 1986 and to 76 million households in 1990.

TABLE 2 (Continued)

Availability and Use Of Electronic Mass Media (Millions): 1970-1990

	1970	1975	1980	1982	1986	1990
Videocassette Recorders						
Homes with Access	-	70	78	83	90	97
Owners		.3	2	5	13	15
Videodisc Players						
Homes with Access	-	-	78	83	90	97
Owners	-	-	.02	.3	3	7
Videogames						
Homes with Access	-	70	78	83	90	97
Owners	-	NA	11	15	22	29

NA = Not Available

Sources: Donaldson, Lufkin & Jenrette, Industry Viewpoint: Cable '82 at 7, 9, 35 (Oct. 1982); Paul Kagan Assocs., Inc., Cable TV Databook 36, 51 (1982); Media Science Newsletter, June 1-15, 1982, at 2; Doyle Dane Bernbach, Inc., The Media Scene: What Will It Look Like? 11 (1982); Television Digest, Inc., Television Factbook, Services Vol., at 79-a, 83-a (1981-82 Ed.); Titsch Publishing, Inc., Cablefile 93 (1982); Paul Kagan Assocs., Inc., MDS Databook 13 (Oct. 1982)

Table prepared by Alan Pearce, Ph.D., January 18, 1983

TABLE 12

Media Activities of Selected Participants in Video Marketplace

Company	Cable System Ownership	Broadcast TV Ownership	Theatrical Film Production/ Distribution	Cable Network Service Ownership	Original Broadcast/ Cable Program Production	Broadcast Syndication	Video Cassettes/ Discs	MDS/STV/ SMATV/ Teletext
American Express Co.	x			x	x			x
Coca-Cola Co. (Columbia Pictures)			x		x	x	x	
Cox Communications	x	x		x	x			x
Dow Jones and Co.	x			x	x			x
Embassy Communications	x	x	x		x	x	x	x
Getty Oil Co.				x	x			
Gulf & Western Industries, Inc. (Paramount Pictures)			x	x	x	x	x	
Hearst Corp.		x		x	x	x		
Lorimar			x		x	x		
MCA, Inc.			x	x	x	x	x	
Metromedia, Inc.		x			x	x		
MGM/UA			x		x	x	x	
Multimedia, Inc.	x	x			x	x		
S.I. Newhouse & Sons	x			x				x
Oak Industries Inc.	x		x	x	x	x		x

TABLE 12 (Continued)

Media Activities of Selected Participants in Video Marketplace

Company	Cable System Ownership	Broadcast TV Ownership	Theatrical Film Production/ Distribution	Cable Network Service Ownership	Original Broadcast/ Cable Program Production	Broadcast Syndication	Video Cassettes/ Discs	MDS/STV/ SMATV/ Teletext
Orion Pictures, Inc.			x		x	x		
Reeves Communications Corp.			x		x	x		x
Storer Communications, Inc.	x	x		x				x
Taft Broadcasting Co.	x	x	x	x	x	x		x
Tele-Communications, Inc.	x			x				
Telepictures Corp.			x		x	x		
Time Inc.	x	x		x	x			x
Times Mirror Co.	x	x		x				x
Tribune Co.	x	x			x			
Turner Broadcasting System, Inc.		x		x	x	x		
Twentieth Century-Fox Film Corp.			x		x	x	x	
Viacom International Inc.	x	x		x	x	x		x
Walt Disney Productions			x	x	x	x	x	
Warner Communications Inc.	x		x	x	x	x	x	x
Westinghouse	x	x		x	x	x		

Sources: Advertising Age, June 28, 1982, at M-43, M-52 (for Hearst and S.I. Newhouse); Annual Reports and Forms 10-K (for remaining listed companies)

TABLE 13

Gross Revenues for Selected Companies Engaged in Video Distribution Market, Fiscal Year Ending in 1981 ($000s)

American Express Co.	7,211,000	
Coca-Cola Co. (Columbia Pictures)	5,889,000	
Cox Communications	403,497	
Dow Jones and Co.	641,024	
Embassy Communications	NA	
Getty Oil Co.	13,251,560	
Gulf & Western Industries, Inc. (Paramount Pictures)	5,477,741	
Hearst Corp.	NA	
Lorimar	169,504	(7/31/82)
MCA, Inc.	1,328,988	
Metromedia, Inc.	461,781	
MGM/UA	299,404	
Multimedia, Inc.	195,276	
S.I. Newhouse & Sons	1,400,000	
Oak Industries Inc.	507,119	
Orion Pictures, Inc.	102,694	
Pioneer Electronic Corp.	1,433,755	
Reeves Communications Corp.	231,149	(6/30/82)
Storer Communications, Inc.	276,437	
Taft Broadcasting Co.	358,196*	(3/31/82)
Tele-Communications, Inc.	181,426	(6/30/82)
Telepictures Corp.	36,932	(1/1-9/30/82)
Time Inc.	3,296,382	
Times Mirror Co.	2,155,970	
Tribune Co.	1,406,320	
Turner Broadcasting System, Inc.	95,047	
Twentieth Century-Fox Film Corp.	567,462	(8/28/82)
Viacom International Inc.	210,436	
Walt Disney Productions	1,005,040	
Warner Communications Inc.	3,237,153	
Westinghouse	9,367,500	
CBS	4,125,954	
ABC	2,443,713	
RCA	8,004,800	

---

* Net Revenues

NA = Not Available

Sources: Advertising Age, June 28, 1982, at M-43, M-52 (for Hearst and S.I. Newhouse); Annual Reports and Forms 10-K (for remaining listed companies)

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
	)	
Amendment of 47 CFR §73.658(j); the Financial Interest and Syndication Rules	)	BC Docket No. 82-345

COMMENTS OF
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Of Counsel.

January 26, 1983.

EXAMPLES OF STRONG MARKET DEMAND FOR PAY PER VIEW

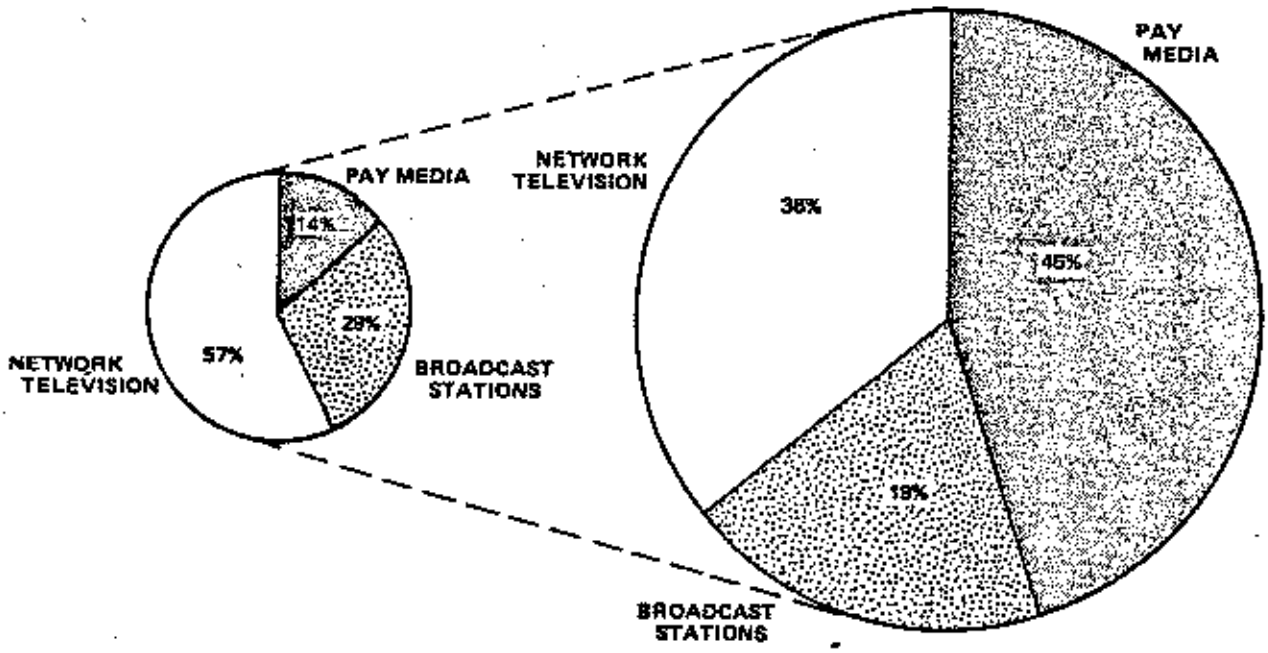
Event	Date	Total Revenues
Leonard-Hearns fight	9/81	$ 8 million
The Rolling Stones Concert	12/81	$ 2 million
Holmes-Cooney fight	6/82	$ 9 million
Star Wars	9/82	$10 million
Sophisticated Ladies	11/82	$ 1 million
Hearns-Benitez fight	12/82	$ 4 million
The Who concert	12/82	$ 1 million

Sources: Variety, Sept. 23, 1981, p. 42 (Leonard-Hearns); Satellite News, Jan. 4, 1982, p. 7 (The Rolling Stones); Advertising Age, Electronic Media Edition, June 4, 1982, p. 12 (Holmes-Cooney); CableVision, Nov. 22, 1982, p. 51 (Star Wars); The New York Times, Nov. 20, 1982, p. 49 (Sophisticated Ladies); Multichannel News, Dec. 13, 1982, p. 1 (Hearns-Benitez); Paul Kagan Associates, Pay TV Newsletter, Jan. 10, 1983, p. 6 (The Who).

THE GROWTH OF PAY MEDIA PROGRAMMING EXPENDITURES

SEGMENTATION OF TOTAL HOME VIDEO PROGRAMMING EXPENDITURES

Percent Change 1982-1990	
Pay media programming expenditures	980%



Source: Booz, Allen & Hamilton Inc, estimates, expressed in current dollars.

FCC BC DOCKET No. 82-345

AMENDMENT OF THE COMMISSION'S SYNDICATION AND FINANCIAL INTEREST RULE

THE COMMERCIAL TELEVISION INDUSTRY: PUBLIC POLICY AND MARKET DEVELOPMENT

A Report on the Development and Growth of Commercial Television,
New Competition, and the Policy Goals
of Efficiency and Diversity

Prepared By:

WALTER G. BOLTER, Ph.D., C.P.A.

BOLTER & NILSSON,

Consultants

Bethesda, Maryland

January, 1983

CHART 59

67

Fully Expanded Growth Projections For Existing and New Video Technologies For The Top Five Commercial Television Markets: 1986*

1981 Rank	Market	Cable T.V. 1986	Cable T.V. Long Term Antcp.	MDS 1986	MDS Long Term Antcp.	UHF & VHF 1986	UHF & VHF Long Term Antcp.	DBS 1986	DBS Long Term Antcp.	Low Power TV 1986	Low Power TV Long Term Antcp.
1	New York:										
	Channels	39	39+	4	5-10	14	15	3+	3+	22	22
	% homes passed	42%	100%	–	–	–	–	–	–	–	–
2	Los Angls.:										
	Channels	21	21+	7	5-10	19	20	3+	3+	29	29
	% homes passed	47%	100%	–	–	–	–	–	–	–	–
3	Chicago:										
	Channels	39	39+	5	5-10	14	13	3+	3+	18	18
	% homes passed	38%	100%	–	–	–	–	–	–	–	–
4	Philadel.:										
	Channels	25	25+	4	5-10	11	13	3+	3+	12	12
	% homes passed	61%	100%	–	–	–	–	–	–	–	–
5	Boston:										
	Channels	25	25+	3	5-10	9	9	3+	3+	12	12
	% homes passed	31%	100%	–	–	–	–	–	–	–	–

*1986 are actual and currently applied for figures. Homes passed are based on ADI television households; cable channels are weighted averages for the franchised systems; cable 1986 homes passed figures assume current cable franchised systems will pass 100% of homes in their areas; anticipated figures assume all households will take cable if available. 1986 figures for other technologies count through 1981 applied for applications and suppliers stated intentions. Anticipated figures are based on the following: MDS (Docket 80-112 figures), VHF and UHF (total allocated channels), and DBS (same as 1986).

Sources: National Association of Broadcasters, *New Technologies Affecting Radio and Television Broadcasting*, 1981; Bolter & Nilsson estimates, ©, 1983.

CHART 60

Fully Expanded Growth Projections For Existing and New Technologies For Smaller Commercial Television Markets: 1986*

1981 Rank	Market	Cable T.V. 1986	Cable T.V. Long Term Antcp.	MDS 1986	MDS Long Term Antcp.	UHF & VHF 1986	UHF & VHF Long Term Antcp.	DBS 1986	DBS Long Term Antcp.	Low Power TV 1986	Low Power TV Long Term Antcp.
67	Sprgfld, IL:										
	Channels	2t	21+	4	5-10	6	11	3+	3+	2	2
	% homes passed	61%	100%	–	–	–	–	–	–	–	–
119	Waco:										
	Channels	12	12+	2	5-10	4	6	3+	3+	8	8
	% homes passed	62%	100%	–	–	–	–	–	–	–	–
138	Odessa:										
	Channels	13	13+	2	5-10	4	7	3+	3+	3	3
	% homes passed	69%	100%	–	–	–	–	–	–	–	–
144	Eugene.:										
	Channels	12	12+	3	5-10	3	4	3+	3+	3	3
	% homes passed	81%	100%	–	–	–	–	–	–	–	–

*1986 are actual and currently applied for figures. Homes passed are based on ADI television households; cable channels are weighted averages for the franchised systems; cable 1986 homes passed figures assume current cable franchised systems will pass 100% of homes in their areas; anticipated figures assume all households will take cable if available. 1986 figures for other technologies count through 1981 applied for applications and suppliers stated intentions. Anticipated figures are based on the following: MDS (Docket 80-112 figures), VHF and UHF (total allocated channels), and DBS (same as 1986).

Sources: National Association of Broadcasters, *New Technologies Affecting Radio and Television Broadcasting*, 1981; Bolter & Nilsson estimates, ©, 1983.

NON-CABLE PAY TV SERVICE

March 1983

Report #543

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WU Telex: 64-3452

Exhibit 5-8

Summary of MDS Subscriber Projections*
1982-1992
(000's)

	1982	1984	1987	1992
MDS Subscribers	550	2,200	3,800	6,300
Percent of households not passed by cable	2%	7%	13%	21%
Households not passed by cable	35,000	32,000	30,000	30,000

* Assumes FCC approves multichannel MDS service.

Sources: All forecasts, Communications Studies and Planning International. CableVision for 1982 pay TV subscriber estimate.

The Home Video & Cable Report

Cable TV, pay TV, video tape, video disc, videotext, STV, MDS, LPTV.

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HOME VIDEO MARKET INDICATORS, AS OF SEPT. 1, 1983

SEGMENT	JAN. 1983	SEPT. 1983	YEAR-TO-DATE GAIN	%GAIN	PENETRATION[1]
Homes Passed by Cable	53.5 million	59.1 million	5.6 million	10.5%	70.4%
Basic Cable Subscribers	27.2 million	30.5 million	3.3 million	12.1%	36.3%
Pay Cable Subscribers[2]	20.6 million	25.9 million	5.3 million	25.7%	30.9%
STV Subscribers	1.3 million	918,000	-442,000	-32.5%	1.1%
MDS Subscribers	795,000	660,000	-135,000	-17.0%	0.08%
VCR Unit Sales[3] (cumulative)	5.29 million	7.49 million	2.2 million	41.6%	8.9%
Video Disc Players (cumulative)	345,000	488,000	143,000	41.4%	0.05%
Two-way Cable Subscribers	185,000	250,000	65,000	35.1%	0.03%
Commercial Teletext or Viewdata	64,600	108,000	43,400	67.2%	0.01%

[1]Based on 83.9 million TV homes, derived from A.C. Nielsen Co. projections.
[2]Penetration estimate is based on 56% of basic cable subs (about 17.1 million homes) subscribing to one or more pay services.
[3]Sales to dealers, according to the Electronic Industries Association.